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WORKING PLAN FOR THE FORESTS OF TANJORE DISTRICT

BY

SAID-UD-DIN AHMED SAHIB BAHADUR
(Extra Assistant Conservator of Forests)

1935-36 TO 1944-45

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INTRODUCTION.

In 1915 as a result of the 1913 Forest Committee's report, all reserves in the Tanjore district were disafforested except two, namely, Kodiakadu (mixed) and Talanayar (Mangrove) Reserves.

Similarly all reserved lands except Muthupet were handed over to the Public Works Department.

It was ordered by the Board of Revenue that the two reserved forests (Kodiakadu and Talanayar) together with Muthupet Block (notified by the Collector of Tanjore in 1911 as reserved land) should be managed by the Revenue Department and that the District Forest Officer, North Arcot, should prepare a working plan for the guidance of the Revenue officials. Accordingly Mr. Chengappa prepared a working plan which was sanctioned in B.P.F. No. 227, Mis., dated 28th August 1918.

On account of the various deviations, some unauthorized, revision of the working plan was suggested (by Mr. Madan, the Conservator of Forests) in C.C.P. No. 52, Press, dated 26th January 1934, and I was posted for the work by the Chief Conservator.

I joined duty in Tanjore about the middle of May 1934 and completed the working plan by end of February 1935.

In addition to the preparation of the working plan, I carried out under orders of the Conservator of Forests, Coimbatore Circle, odd jobs, e.g., survey and preparation and submission of section 4 notifications and maps for Muthupet Mangrove Block (16,810 acres) and three small extensions (700 acres) to the Kodiakadu Reserve, laying out correctly on the ground as per section 16 notification the whole of the eastern and a portion of the southern boundary of the Kodiakadu Reserve, marking and felling of trees in the Mount Stuart Teak plantations of Coimbatore South division, and doing some minor works in the Conservator's office.

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PART I

Summary of Facts on which the proposals are based.

CHAPTER I.—THE TRACTS DEALT WITH.

NAME AND SITUATION.

1. The three reserves dealt with, viz., Kodiakadu, Talanayar and Muthupet lie in the Tiruturaipundi taluk of Tanjore district. The working plan will be known as the Tanjore Working Plan, as there are only three reserves in the whole district.

2. Tiruturaipundi taluk is bounded on the north by Negapatam and Mannargudi taluks, on the east by Bay of Bengal, on the south by Palk Strait, and on the west by Pattukkottai and Mannargudi taluks and lies between longitude E. 79° 30′ and 79° 55′ and latitude N. 10° 15′ and 10° 40′.

The taluk is traversed by the following sections of the South Indian Railway :—

(1) Mayavaram-Arantangi; and

(2) Tiruturaipundi Agastiyampalli. (23 miles opened in 1919.)

Agastiyampalli railway station is less than two miles from the northern boundary of the Kodiakadu Reserve.

One of the conditions on which the District Board transferred the No. 2 line to Government of India in 1929 being that it should be extended up to Point Calimere and the Government of India having consented to it, the necessary surveys have been carried out by the South Indian Railway, who are managing the line on behalf of the Government of India. The final alignment runs through Kodiakadu Reserve close to its western boundary. The extension is expected to be completed very shortly.

3. The three reserves are scattered and are situated far apart from one another.

With reference to Tiruturaipundi town where the Tahsildar, who does the duty of the Range Officer, resides, Talanayar Reserved Forest is situated almost due east of it at a distance of about 13 miles; Kodiakadu Reserved Forest is in the south-east about 25 miles away and Muthupet is about 20 miles south-west of Tiruturaipundi. Talanayar is a land-locked mangrove situated along the banks of the river Addapar, one of the many streams through which Cauvery empties its surplus waters into the sea. The central backwater lagoon in the Talanayar Reserved Forest is connected with the sea by the Addapar which falls into the sea near Toputurai.

The eastern and southern boundaries of Kodiakadu Reserved Forest almost touch the Bay of Bengal and the Palk Strait respectively. Point Calimere Light House is near the south-east corner of the reserve.

Muthupet Government forest is situated on the south-east of Muthupet village along the banks of the Koriar, which is another important river, through which the surplus waters of the Cauvery run into the sea. Palk Strait forms the southern boundary of this block.

There is a vast swamp running for a length of over about 35 miles from west to east along the Palk Strait and at its extreme west end is situated the Muthupet Reserve which still retains its swampy mangrove nature. But at the other end on the East near the Bay of Bengal, the ground has become reclaimed by formation of sand dunes which support the usual scrub type of forest growth.

CONFIGURATION OF THE GROUND.

4. The tract dealt with is a large alluvial plain sloping gently towards the sea and is quite level save for the ridges and mounds of blown sand along the coast.

(A) Kodiakadu Reserve which is just a few feet above the sea level lies wholly on an undulating sandy plain intersected with many blanks and broad but shallow saline swamps. These swamps for the most part of the year are dry, but during the rains are connected with the backwaters to the north and west.

These blanks and swamps take up half the area of the reserve. Roughly swamps cover about twice the area that is covered by blanks. Near the western boundary, blown sand has formed a high ridge running North-South for some distance in the reserve. The famous Vedaranniyam Salt Swamp which was utilized by Government for the collection of spontaneous salt, before the ordinary method of manufacturing salt was introduced here, touches the northern boundary of this reserved forest.

(B) Talanayar is a land-locked *mangrove* with alluvial miry soil mixed with ferruginous sand and clay impregnated with salt. The area is intersected with Addapar, Nallar and a couple of lagoons. Mallaialam, the central lagoon is connected with the sea by the Addapar. Most of the area is liable to submersion in the rains.

Blanks, rivers and lagoon occupy about $\frac{7}{8}$ and the wooded area only about $\frac{1}{8}$ of the area of the reserve.

(C) *Muthupet.*—This is also a tidal forest with soil similar to that of Talanayar but much more miry, and treacherous, especially along the seashore.

The block has extensive blanks and is traversed by several big lagoons and numerous rivers and streams. The wooded area forms only a fraction of the reserve roughly about 1/16.

There are several rivers and streams which run through the mangrove forests of Muthupet and Talanayar Reserve. The more important of these are mentioned below :—

(1) Addapar.
(2) Nallar.
(3) Koriar.
(4) Kilanthangiar.
(5) Velvanar.

Of these Nos. (1) and (2) are in the Talanayar Reserve and the remaining in the Muthupet block.

All the rivers are affected by sea tides and are navigable for short distances by small boats with a couple of foot draft throughout the year.

The Vedaranniyam-Negapatam canal, constructed in 1869 chiefly to transport Government salt, runs along the eastern boundary of the Talanayar Reserve. But after the construction of the railway line between Tiruturaipundi and Agastyampalli (1919) the canal has lost much of its importance as means of communication and serves at present more as a drainage channel. Due to disuse it sometimes gets silted up (1933–34) in the portion between Talanayar Reserve and Negapatam and is then closed to traffic. The Public Works Department is in charge of this bit and does the silt clearing whenever the bed of the canal gets badly shoaled.

GEOLOGY, ROCK AND SOIL.

5. The geology of the tract is very simple. Alluvium with variation in its composition forms the entire geological structure.

The sandy character of the superficial beds of alluvium at the seaward extremities is a noticeable feature of the tracts dealt with.

CLIMATE.

6. (*a*) Tanjore district is generally supposed to be healthy but has a prolonged hot season which practically extends from March to October. The coolest months are December and January with an average temperature of about 83°. The hottest months of the year are April, May, June and July. In June perhaps the temperature rises to its highest and the heat is most intense. Strong westerly winds which begin in May, continue through July and part of August. In the latter part of August close sultry weather follows and continues till the setting of the North-East monsoon in October or November when the temperature falls perceptibly. Point Calimere Bungalow, however, which is enclosed by the sea on the east and the south, by a large back-water swamp filled with sea water on the west, and by forest on the north, is completely protected from the hot land winds and is particularly cool and pleasant during the hot months.

(*b*) *Storms and hurricanes.*—These are of frequent occurrence on the coast during the months of March to May. Occasionally they occur in November also.

(*c*) *Rainfall.*—In Tiruturaipundi taluk most of the rain is recorded during the North-East monsoon and the coastal tract is better watered than the inland areas.

There are three rain-gauge stations in the taluk namely at Muthupet, Tiruturaipundi and Vedaranniyam. The average monthly rainfall in inches recorded at each station from 1870–1930 is given below :—

Months.	Average rainfall (1870–1930) in inches.			
	Muthupet.	Tiruturai-pundi.	Vedaranniyam.	District average.
				ACS.
January	3·24	3·81	5·15	3·11
February	1·88	0·76	1·38	0·94
March	0·60	0·73	1·05	0·63
April	2·03	1·25	1·06	1·04
May	2·68	1·76	2·16	2·24
June	1·13	1·10	0·89	1·23
July	1·90	1·92	1·40	1·91
August	2·61	2·81	2·33	3·49
Septembe	5·17	3·97	3·85	4·28
October	9·42	9·52	12·01	9·17
November	11·77	13·10	19·02	11·76
December	6.61	6·33	9·28	6·12
Average for the whole year ..	49·04	47·06	59·58	45·92

(*d*) The following diseases occur in the district :—

Fevers.—Fevers appear, generally during May, June and July (when hot westerly winds blow) and again in November, December and January (when the cold north-easterly winds prevail). They are generally not of a malarious type.

Smallpox.—Appears chiefly during hot season. There was a very severe epidemic in 1900 and less severe in 1923 and 1924.

Cholera.—A severe epidemic usually occurs in delta year after year in November. It continues in December, January and February and then subsides. A second outbreak starts generally in uplands during the summer months in May, June, July and August and dies out with the onset of the North-East monsoon.

Elephantiasis is present in endemic form.

Hookworm.—An anti-hook worm party visited the district in 1925–26 and conducted investigations and found that nearly 56 per cent of the population was infected with that disease.

WATER-SUPPLY.

7. Although both Muthupet and Talanayar Reserves are traversed by numerous streams and rivers, they, being subjected to tidal influence, all contain salt water, at least, for most part of the year. The water is most saline in June and least brackish in December and January.

It is very difficult to get fresh water for drinking. Not only is this difficulty felt within the reserves but also in most of the surrounding villages. Few villages have wells though nearly each and every village contains, at least, one tank which is used for all purposes, i e., for bathing, washing, watering cattle and at the same time as a source of drinking water. Point Calimere forest bungalow (a gift made in 1910 to the Forest Department, by a local resident Mr. O. Ayadurai Pillai), has no well of its own and water has to be brought over a considerable distance from Kodiakadu on bullock cart.

For Tiruturaipundi Public Works Department Rest-house, fresh water for drinking purpose, has to come from the railway station nearly two miles distant. For general use brackish water is available in nearer wells.

In Kodiakadu Reserve Forest Palaikulam tank contains water for cattle throughout the year while Moniumkulam, Titakulam and Vondrandukkulam contain water only during the rains.

For Point Calimere Marine bungalow water has to be brought from Kodiakadu at Re. 0–1–6 per small pot. Eight such pots of water are generally sufficient for the economical use of a single officer. There is a fresh water pond near the lighthouse but the water is required for the lighthouse staff.

At Agastiampalli there is a tank belonging to the Salt Department from which drinking water has to come. Bathing and washing clothes are not permitted in this tank.

DISTRIBUTION AND AREA.

8. The total area of the reserved forests of Kodiakadu and Talanayar according to the revised notifications (No. 273, dated 9th September 1922 and No. 451, dated 28th October 1931) is 3,645 and 3,054·83 acres, respectively. An area of 310 acres

has recently been added to the Kodiakadu Reserved Forest as a result of the correct laying out of the eastern boundary on the ground by the Working Plan Officer. So the area of Kodiakadu Reserved Forest is now increased to 3,955 acres.

(*Note.*—It has now been proposed to extend the eastern boundary of Kodiakadu Reserve to the sea and section 4, notification has already been sent by Working Plan Officer to Chief Conservator. If Government accept this proposal, the area will be further increased by some 600 acres.)

A revised section 4, notification has also been sent up by Working Plan Officer with a view to reserve an area of 16,810 acres in Muthupet. But a good deal of this area is covered by a large lagoon which has been included in order to get a satisfactory line.

Only about half of the Kodiakadu Reserved Forest and only a fraction of Talanayar and Muthupet blocks are wooded and workable.

9. The headquarters of the Revenue Divisional Officer who is the ex-officio District Forest Officer and those of the Tahsildar who is the ex-officio Range Officer are at Mannargudi and Tiruturaipundi, respectively. Each reserve forms one beat.

The staff at present consists of one Forester, four Forest guards, two Reserve watchers and one bungalow watcher distributed as follows :—

For Muthupet block there is one Forest guard and one watcher both of whom live at Jamban Odai about 2 miles from Muthupet.

For Talanayar there is only a Forest guard who lives at Nalu Veda Pathi within two miles of the Eastern boundary of the reserve. In previous years this Forest guard used to be given the help of a watcher from Kodiakadu during the months of May to August, when thefts are most common. But for the last two years he does not get this temporary help, but it is desirable that he should be given a watcher.

Kodiakadu has two Forest guards, one Reserve watcher (plus 1 bungalow watcher) who all patrol together. The Forester at Kodiakadu exercises a general supervision over the guards and watchers in charge of all the three reserves.

10. *Classification of reserves.*—Originally Kodiakadu and Talanayar Reserved Forests were placed under Class II Reserves (B.P.F. 375-Mis., dated 22nd December 1916). But at the suggestion of a committee called by the Collector at Tanjore on 13th December 1927, Kodiakadu was transferred to Class I and Talanayar to Class III. At the same time it was decided, on the unanimous recommendations of the Committee, to leave these reserves under the management of the Revenue Department (G.O. No. 791, Development, dated 30th April 1928).

STATE OF BOUNDARIES.

11. The reserve boundaries are cleared lines about 12 feet broad. For want of stone-quarries within reasonable distances, demarcation by stone-cairns and stone-slabs is out of question. Therefore small earthen cairns with a post in the centre are constructed at all bends and intermediate stations, except in Muthupet block where the section 4 notification boundary is demarcated at present merely by posts.

In Kodiakadu Reserved Forest cuttings of Odina are being introduced as posts in the hope of their striking roots and establishing themselves as live-trees.

On verification of the boundary of this reserve, it was found by the Working Plan Officer that the eastern and a portion of its southern boundaries were wrongly demarcated and a large slice (some 300 acres in extent) had been left out. The area wrongly excluded is a grassy blank and does not contain any tree growth at present.

The correct boundary as per the section 16 notification has been now laid out by the Working Plan Officer.

Enclosure lines are demarcated merely with survey stones at corners. Steps will have to be taken to get them demarcated by cut and cleared lines as well.

Note.—The patta enclosures in Kodiakadu Reserved Forest support a thick stunted thorny growth 6 to 8 feet high and are neither fit as grazing ground nor for cultivation.

Their old and new survey numbers and areas are noted below :—

New survey number.	Old survey number.	Area in acres.
59	46	3·48
60	47	2·78
61	48	2·99
62	49	0·29
63	50	10·71
64	51	2·29
	Total ...	**22·54**

In addition to these, there are 5 temples admitted as enclosures which are detailed in the concerned section 16 notification. There are no enclosures in the Talanayar Reserved Forest or in the Muthupet block.

Talanayar Reserved Forest.—A triangular area of about 4 acres at the extreme South-Western end of Talanayar Reserved Forest and to the west of Vandal road was ordered to be excluded from the reserve in the Chief Conservator's Reference No. 2659/26, dated 11th August 1927. Though this area has been excluded and a new cairn constructed yet this exclusion has not been notified. Necessary action is being taken.

LEGAL POSITION.

12. Kodiakadu and Talanayar Reserved Forest which have long been settled are the absolute property of the *State* subject to certain public rights of ways, etc., specified in the respective section 16 notifications.

Muthupet block has not yet been settled, but as stated already section 4 notification has been sent up by the Working Plan Officer after carrying out the necessary survey.

RIGHTS AND CONCESSIONS.

13. The various rights and concessions admitted at the time of settlement are contained in the *Fort St. George Gazette* notifications as noted below :—

Talanayar Reserved Forest.—No rights were admitted—vide notification No. 234, dated 4th August 1888.

Kodiakadu.—Notification No. 188, dated 4th May 1892, published at page 598 of Part I of *Fort St. George Gazette*, dated 10th May 1892.

Muthupet block is not yet finally notified.

CHAPTER II.—THE FORESTS.

COMPOSITION AND CONDITION OF THE CROP.

General Description.

14. The forests may be divided into two types—

(1) The dry evergreen type of Kodiakadu.
(2) The tidal forests of Muthupet and Talanayar.

15. (1) *Kodiakadu Reserved Forest.*—The wooded portion, which forms roughly about 50 per cent of this reserve, contains a dense growth of stunted dry-evergreen type of vegetation consisting mainly of Mimusops hexandra, Mimusops littoralis, Mimusops elangi, Memecylon edule, Salvadora persica, Maba buxifolia, etc. A list of trees and shrubs in this reserve is given in Appendix I.

16. (2) In the tidal forests of Muthupet and Talanayar the following species are found :—

(1) Avicennia officinalis (Alayathi).
(2) Acanthus illifolius (Nirmulli).
(3) Aegiceras majus (Kanna or karapu kanna).
(4) Clerodendron inerme (Peekalati).
(5) Excoecaria agallocha (Tillai).
(6) Suaeda monoica (Umri).
(7) Suaeda nudiflora (Nandi).

Note.—Local names are noted within brackets.

Of these No. 1 is the most important from our point of view. Nos. 1 and 5 grow into small trees, the rest form the undergrowth. No. 5 is not a good fuel species. There is a solitary Rhizophora mucronata (Kanda) bush standing in the Addapar near the Central Lagoon in Talanayar.

17. In the case of Talanayar Reserved Forest the growth is confined to a narrow belt along the Mallaialam and Mattialam lagoons, and to a few patches along the Addapar, Nallar and Palar streams. The best growth lies towards the north-west portion of the Reserve.

In Muthupet, the growth is confined to the banks of the Koriar and the lagoon and to a limited extent along other streams. The best growth is on both sides of the Koriar for about a mile up stream near its mouth where it empties itself into the lagoon.

Natural Regeneration.

18. In the Mangrove forests, Avicennia, which forms about 90 per cent of the tree crop, does not coppice and the regeneration is solely by seed.

The natural regeneration of Avicennia is satisfactory in Muthupet but not quite so in Talanayar. The reason possibly being that Muthupet is situated close to the sea and most of its area is liable to frequent submersion, due to tidal inundations—a condition conducive to the growth of Avicennia. In Muthupet, over an area of about 70 acres, we have one of the finest Avicennia virgin patches in the Presidency with trees 30 to 40 feet in height and 2 to 3 feet in girth.

19. In the Kodiakadu Reserve, the natural regeneration both by self sown seed and coppice of almost all species except Mimusops, is satisfactory especially so of Kasan (Memecylon). The regeneration of Mimusops, either by coppice or by seeds has been most disappointing. This was noticed even as early as in 1911 when the Collector, reporting to the Conservator on the result of regeneration in Coupe VIII felled experimentally in 1908–09 under B.P. Mis. No. 219, dated 10th March 1908, stated " Palai stumps (the main species of the Reserve) were not seen to be coppicing well and that the shoots which came up did not thrive. "

Even the 1918 working plan [under sub-head (3) the exploitable age] makes mention of there being practically no natural reproduction of this (Mimusops) species and of the existing trees being mostly over mature and of there being no lower age classes properly represented. Palai (Mimusops) is however the most common species, and, in fact, the only timber tree of any consequence in Kodaikadu where it is found growing on almost pure sand. But due possibly to unfavourable condition of the soil or due to growing in the open forest as against even aged crop, it has short bole with a broad and spreading crown. In some cases the tree is so stunted and shrub-like that its branches almost touch the ground. This may also be due to the protection afforded by the nature to such trees against frequent cyclonic coastal winds, because the more the tree is low and its branches spreading, the greater is its resistance against the wind.

An experimental plot has been opened in 1934 in Coupe XVIII of 1918 Working Plan to see the effect on coppice of high and low fellings of Palai (Mimusops).

It is difficult to say what exactly is the cause of the species not reproducing itself even by seed, unless it be that it is one of the species like *Acacia arabica*, the seed of which requires agency of animals, to germinate satisfactorily or that several causes like deficiency of seed, and want of rain at proper time contribute to its failure to grow from seed.

It is possible that the seed which is sweet and edible is removed almost completely by villagers and what little remains lies exposed to the scorching sun (the fruit ripens in May and June when the heat is intense) does not germinate or if it does, the tender seedlings cannot stand the exposure.

In other Provinces also Palai (Mimusops) has been found not to reproduce itself easily.

I have however noticed recently a few Palai seedlings, 4 to 5 feet high, coming up under low bushes having not too dense a shade. From which one is led to infer that Palai (Mimusops) though a light demander, requires a light shade (but not so heavy as a mature Palai gives) in early stages, to establish itself.

The reproduction of Memecylon (Kasan) by seed is prolific. This may be due to its seeding twice in the year and also due to the fact that its seed does not fall till the worst hot weather is over.

INJURIES TO WHICH THE CROP IS LIABLE.

20. The several causes of damage to which the forests are liable are given below :—

(I) *Natural causes*—

(1) *Fire.*—Only in Kodiakadu Reserve is there any chance of a fire occurring. But even here, damage, if any, is negligible.

There can, of course, be no fires in the mangrove forests.

(2) *Winds.*—Strong coastal winds occasionally, break an isolated Avicennia seed bearer in the mangrove, or a tree here and there in Kodiakadu, but the damage is negligible. But due to constant strong southerly winds trees and bushes nearer the sea coast and in exposed localities are bent and occasionally their crowns touch the ground.

(3) *Drought.*—Although Tanjore district is never known in the living memory to have suffered from real drought, yet the prolonged hot weather from March to October acts certainly adversely to the growth in the dry forest of Kodiakadu, where, due to the intense heat, seeds of species which ripen in hot weather (e.g., Palai) fail to germinate and the tender seedlings become scorched by the sun.

(4) *Rise of ground level or change of water course.*—This phenomenon is confined only to the mangroves and more especially to Muthupet, where, due to the nearness to the sea, tidal action is very strong and silt deposits are heavy and frequent. With the result that in some places there is rise in the ground level, while in other places small streams silt up or change their courses and thus are removed from the influence of daily tides. With such physical changes, there are changes in the forest growth also. Because Avicennia, being deprived of its optimum condition, namely, inundation by the daily tides, graudually disappears from such areas.

(5) *Insect.*—Cochineal insect was introduced intentionally to kill prickly-pear in Kodiakadu. Damage by other insects is not noticed.

21. (II) *Other than natural causes*—

(i) Of these the most important is man. Due however to certain physical features and the amount of protection afforded by nature to these forests, illicit fellings are not very common.

(ii) *Animals—Grazing.*—Cattle, on one hand, by treading, make the soil hard and unsuitable for seed to germinate easily, while on the other hand by trampling down, and browsing upon, seedlings and tender shoots, retard the growth and thus cause double damage to the future crop.

I know it from my personal experience that although cattle brought up in localities away from mangrove forests do not particularly care for Avicennia, yet cattle born and bred up in the villages dependent on the mangrove for grazing, eat avidly the tender shoots and seedlings of this species (Avicennia), although this fact has been denied by some of the Revenue officers here.

In Kodiakadu there are semi-wild cattle and ponies that live day and night in the reserve forest and do damage by trampling and grazing. Wild pigs dig up succulent roots and tubers, and eat fallen fruits and thus reduce chances of natural regeneration.

CHAPTER III.—UTILIZATION OF THE PRODUCE.

Agricultural Customs and Wants of the Population.

General.

22. (1) Tobacco growing is the most important form of cultivation in Kodiakadu, Vedaranniyam and other villages round the Kodiakadu Reserved Forest.

(2) Round Muthupet and Talanayar Reserves, paddy is the most important crop raised.

It is only a few people who own land round these reserves. Others work either as permanent coolies to some landlord or work as daily labourers and a good number live by fishing.

Wood fuel for domestic consumption is bought only by the few comparatively rich people. Otherwise it is bought mostly for brick kilns and rice mills and for marriages and other festivities.

There are many cocoanut and palmyra gardens in Muthupet which supply fuel, thatch and fencing screens (which are made of leaves) for domestic purposes.

In the case of Avicennia, billets below 7 inches in girth are preferred for domestic use and for mills the sizes in demand are from 7 inches to 18 inches girth. For brick kilns there is no objection to billets of any size.

Rice mills are mostly driven by oil engines. Steam boilers for boiling paddy, use husk as fuel either by itself or with a small quantity (about 1 cubic yard per day) of wood to aid combustion.

As far as timber is concerned, rich people generally get Rangoon teak from Negapatam, while the poor get their few requirements from unreserves, where such exist, or buy palmyra and casuarina posts and rafters, etc., and thatch their huts with cocoanut or palmyra leaves.

For boat building, Burma teak is got from Negapatam. But ribs are generally made from *Thespesia populnea* or *Calophyllum inophyllum* both of which species are grown abundantly in villages. Doors are made of Teak or of mango planks.

In some of the villages of the Tiruturaipundi taluk notably in Anaikkaran Chatram, rough cane baskets are made from an inferior kind of cane obtained from the banks of Coleroon and some other streams. For finer kind of work, Singapore cane and cane grown in the Sriharikota island of Nellore are imported.

23. The chief requirements of the people are—

(1) Agricultural implements and small timber for house building.
(2) Firewood including brushwood, and thorns for fencing.
(3) Grazing.
(4) Fishing.
(5) Umri plant (Suaeda spp. The whole plant is used for making a mordant used for fixing dyes).
(6) Manure-leaves.
(7) Shells for lime-manufacture.
(8) Thatch grass.
(9) Shooting.

24. These are dealt with below :—

(1) *Timber.*—Mimusops and Dichrostaychys for posts, Hemicyclea and Maba, etc., for rafters and Memecylon for reepers, and small agricultural implements, are obtained from Kodiakadu Reserved Forest.

Avicennia, is used for overground posts for huts and lasts for a number of years, *if it is not buried under ground.*

For plough shares, shafts, cart wheels, etc., etc., Acacia arabica and other suitable woods growing in villages or on patta fields, are used.

(2) *Fuel.*—As already stated, the poorer classes seldom if ever buy fuel for domestic use. Wood-fuel is as a rule bought only for festive occasions, for mills, and for brick kilns. Thorns for fencing and branch wood to cover tobacco fields during the hot weather winds, are in demand in villages round Kodiakadu.

(3) *Grazing*—(*a*) *Muthupet.*—There are extensive forests and blanks belonging to Chatram Department of the district board, so only the cattle of a couple of surrounding villages, e.g., Jumbanodai, Thillavalagam, etc., may seek grazing in this block when it is reserved.

(*b*) *Talanayar Reserved Forest.*—About 300 cows and buffaloes are licensed.

(*c*) In Kodiakadu about 1,200 cattle roughly are annually licensed to graze.

(4) *Fishing.*—Fishing is a " necessity " for many villagers who live on the borders of Talanayar and Muthupet, as a means of living. In Muthupet fishing in the lagoon is free. It is only some puddles, small streams and a portion (couple of miles), of the Koriar passing through the Government Forests, that are leased out.

(5) *Umri* (*Suaeda*).—This plant is of local importance. It yields a black mordant used in fixing dyes. The whole plant except roots is burnt and used for the purpose.

(6) *Manure leaves.*—There is great demand round Kodiakadu Reserved Forest for manure leaves especially for the leaves of Kasan (Memecylon) either green or dry for manuring tobacco fields—(Kasan leaves are reported to give a peculiarly pleasant flavour to the tobacco leaf). Till 1915 removal of manure leaves, from the Reserved Forest was permitted on payment. But since then, in spite of much agitation, this has been forbidden and it is hoped that any further attempt to revert to the old condition of removal of leaves even on payment, will be very firmly resisted by those in charge of the forests.

(7) *Shells* which are commonly found in all coastal forests are collected for manufacture of lime for local use.

(8) *Thatch grass.*—This is found in Talanayar Reserved Forest and is leased out.

(9) *Shooting* is confined to Kodiakadu Reserve where spotted deer, pigs and black buck are found, the latter two being plentiful.

MARKETS AND MARKETABLE PRODUCTS.

25. The marketable products are—

(1) Small timber from Kodiakadu Reserved Forest.
(2) Fuel from Kodiakadu, Talanayar and Muthupet.
(3) Fishing obtainable in the Mangrove forests of Muthupet and Talanayar only.
(4) Umri (Suaeda species).
(5) Thatch.
(6) Shells.

26. *Markets*—(1) *Vedaranniyam.*—For fuel and small timber from Kodiakadu Reserved Forest the chief market is Vedaranniyam which is one of the most important towns in the taluk with a population of 15,036 (1931). It is some 3 miles from the nearest and 10 miles from the furthest corner of the Reserve. But there is a big swamp on the way between the second and third mile which makes transport rather costly.

(2) *Agastiyampalli.*—Agastiyampalli has a population of 2,688 (1931) including a colony of salt officials. This place is within two miles of Vedaranniyam on the way to Kodiakadu.

(3) *Toputurai.*—Toputurai, a small port, about a couple of miles beyond Vedaranniyam, consumes a small proportion of fuel and timber from Kodiakadu Reserved Forest.

(4) *Muthupet.*—Muthupet with a population of 6,980 (1931) and couple of rice mills which use Alayathi (Avicennia) wood as fuel in combination with husk, is the principal market for fuel and fish from the Muthupet block. It is 3 miles or so from the nearest corner of the block by the river Koriar.

(5) *Tiruturaipundi.*—Tiruturaipundi which is the taluk and range headquarters with a population of 7,351 (1931) and which is situated within 13 or 14 miles of Talanayar Reserved Forest, is a market for fresh fish from that reserve. It is also market for dry fish from Muthupet with which it is connected both by rail and road.

(6) *Negapatam,* which is about 20 miles from Talanayar and 30 miles from Vedaranniyam by the Vedaranniyam-Negapatam canal, used to be an important market for our fuel from Talanayar and Kodiakadu Reserves up to 1928, i.e., before the transfer of South Indian Railway Locomotive Carriage and Waggon Workshops to Golden Rock, Trichinopoly. But now only a comparatively small quantity of fuel from Talanayar Reserve is sent there. Contractors try and sell most of the produce from fuel coupes locally at whatever profit they can.

It is hoped that when the new extension of Tiruturaipundi-Agastiyampalli Railway line is constructed up to Point Calimere it should be possible to send fuel to Tiruturaipundi, Tiruvalur, Negapatam, Mannargudi, etc. This will certainly improve our fuel revenue from the Kodiakadu Reserved Forest.

LINES OF EXPORT.

27. *Railways.*—Tiruturaipundi taluk is traversed by the following sections of the South Indian Railway :—

(1) Mayavaram-Arantangi, and
(2) Tiruturaipundi-Agastiyampalli (23 miles).

No. 2 is going to be extended up to Point Calimere. The final survey is complete and it is expected that the line will be constructed shortly.

Waterways.—Both Talanayar and Muthupet are connected with the local markets by navigable rivers and channels. In addition to the Vedaranniyam-Negapatam Canal, which forms the eastern boundary of Talanayar and is navigable, there are two important rivers namely, Addapar and Nallar in Talanayar which are navigable throughout the year.

Similarly the Koriar which is the most important river for Muthupet block, and, connects the forest with the Muthupet village, is navigable throughout the year.

Road—(*a*) *Metalled roads.*—The taluk has the following sections of metalled road :—

(1) Tiruturaipundi to Muthupet (16 miles).
(2) Tiruturaipundi to Mannargudi.
(3) Tiruturaipundi to Tiruvalur.
(4) Tiruturaipundi to Talanayar.

(*b*) *Unmetalled road.*—(1) There is an unmetalled road between Vedaranniyam and Point Calimere with an extensive swamp on the way. Portions of this road are sandy.

(2) *Tiruturaipundi to Negapatam via Avarikadu and Kallimodu.*—These roads are very difficult during wet weather.

METHOD OF EXPLOITATION AND THEIR COST.

28. Fuel coupes are leased out and so are the saleable items of Minor Forest Produce. Grazing is permitted in Talanayar and Kodiakadu on permits issued by the department.

Collection and removal of fuel and minor forest produce is effected by the contractors themselves.

Fellings in fuel coupes are generally done by coolies from the adjoining villages mostly from Ambalakaran, Pandaram, Padayachi and Gownden classes.

Fellings are done on piece contract at Re. 0–6–0 per cubic yard which in practice varies from 27 cubic feet to 54 cubic feet stacked.

The lessee of Kodiakadu Reserve Fuel coupes pays from Re. 1 to Re. 1–4–0 per cart for transport of firewood according to the distance of the coupe (5 to 7 miles) from Vedaranniyam. Carts are small and do not carry even half a ton of fuel due to a rather large and slushy swamp on the way.

Kodiakadu contractor charges Re. 1 per stack and Re. 0–2–0 per head-load of fuel and thorn, and Re. 0–1–0 per head-load of leaves from consumers, who buy the produce in the coupe and make their own arrangement for the transport.

Talanayar coupe contractor, who pays Re. 0–6–0 per stack of fuel for felling, sells it in the coupe for Re. 0–12–0 per stack. For transport to depot, contractors are reported to have paid Rs. 10 per boat to Negapatam for carrying 10 to 12 cubic yards of fuel from Talanayar Reserve. For Muthupet, the lessee pays Re. 0-6-0 per cubic yard stacked for fellings and Rs. 2 to Rs. 2–8–0 per boat (which carries about 10 to 12 cubic yards stacked of fuel) to Muthupet port, a distance of 3 to 4 miles, and, then pays Rs. 1–8–0 cart hire for the boat load (or roughly about Re. 0–2–0 per cubic yard) of the fuel to the sale depot. In all roughly he pays from Re. 0–11–0 to Re. 0–12–0 per cubic yard on felling and conveyance of fuel to the depot. This does not include the royalty or the overhead charges in the shape of depot rent and depot clerk and his assistants' pay. His retail selling rate varies from Rs. 1–8–0 to Rs. 2–8–0 according to sizes and demand. The wholesale price for mills and for persons buying in quantities is from Re. 0–4–0 to Re. 0–8–0 per cubic yard less than the current retail price at the time.

29. *Umri and Nandi.*—(Suaeda species) which yield Barilla, black mordant used in fixing dye are sold by public auction. The lessee, who is generally a man residing *outside* the district, comes to an agreement with some local man and pays the latter Rs. 14 to Rs. 16 for every 168 lb. of the crude stuff delivered f.o.r., Madura to him. The crude stuff is a heavy mass of burnt " Suaeda " and is obtained in the following way. Suaeda (either species) the whole plant excepting the root is cut and dried for a few days and then burnt in pits by heaping one layer of the dry plant over the other as the former is burnt. The stuff is left in pits for two or three days till it cools down and is then removed to the railway station on boats or carts in bags.

30. *Fishing.*—The right is leased out. The lessee sub-lets certain localities, while in others he allows fishing on permits.

The lessee issues permits or chits at rates which vary according to the method of fishing. Neither the permits nor the rates are uniform.

31. *Grazing.*—Grazing permits are issued by the section forester without any additional cost to the department.

PAST AND CURRENT PRICES.

32. *Fuel.*—According to Mr. Chengappa's Working Plan, the average price of fuel coupes in Kodiakadu realized from 1913–14 to 1916–17, i.e., four years prior to the introduction of the current working plan was Rs. 22–9–6 per acre on the gross area (i.e., wooded area plus blanks—please see page 7 of the Working Plan under fuel). And average for Talanayar coupes was Rs. 5–14–9 (page 4 of the Talanayar Working Plan) and for Muthupet coupes Rs. 54 per acre (page 2 Muthupet Working Plan). Against these averages the prices realized during the last three years on the gross area in the Kodiakadu and Talanayar reserved forests are Rs. 4 and Re. 0–10–9 per acre, respectively.

In case of Muthupet reliable figures are only available for 1933–34 in which year coupe I, with a gross area of 123·8 acres, was sold for Rs. 400. This works out to Rs. 3–3–8 per acre. No coupe was sold in 1934–35, while up to 1932–33 the reserve was being managed by the Chatram Department.

So against the past average prices per acre of Rs. 22–9–6, Rs. 5–14–9 and Rs. 54 realized in Kodiakadu, Talanayar and Muthupet, respectively, during the last three years we got only Rs. 4–11–0, Re. 0–10–9 (ten annas and nine pies) and Rs. 3–3–8 in the above mentioned forests respectively. Disappearance of virgin or old mature forest coupled with want of demand and slump in the market are responsible for this abnormal fall.

33. The most noticeable fall in prices in the case of Minor Forest Produce has been in the case of Umri (Suaeda) leases, for which the average annual lease amount of Rupees 2,820 realized from 1921–22 to 1925–26 in respect of Kodiakadu and Talanayar alone, has dropped to Rs. 294 average price realized from 1930 to 1934.

34. Prices realized for the fuel coupes and for the various items of the Minor Forest Produce during the last ten years or for the period for which figures are available are shown separately for each reserve in the tabular form attached—vide Chapter V of Part I, paragraph 44.

CHAPTER IV.—STAFF AND LABOUR SUPPLY.

STAFF.

35. *Controlling.*—The Revenue Divisional Officer, Mannargudi, is the ex-officio District Forest Officer.

Executive.—The Tahsildar, Tiruturaipundi, is the ex-officio Range officer. This arrangement was sanctioned in G.O. Ms. No. 273, Revenue (Special), dated 28th August 1918.

Protective staff.—This consists of a forester at Kodiakadu four forest guards (2 for Kodiakadu and 1 each for Muthupet and Talanayar), 2 reserve watchers (1 for Kodiakadu and the other for Muthupet; there is none for Talanayar) and one bungalow watcher for the Point Calimere Forest Rest-house.

District forest establishment.—A clerk has been given to the Revenue Divisional Officer and another to the Tahsildar for office work connected with the forest administration. The clerks are, however, not paid from the forest funds.

LABOUR SUPPLY.

36. There is plenty of labour available in villages all round the three forests. In Kodiakadu 30 families of Ambalakaran and about 50 families of Pandarams and in Agastiampalli about 80 families of Ambalakaran are available for felling coupes and doing other manual works in addition to Harijans who are, as a rule, employed ony when caste people are not available at any time in sufficient numbers. Carts are owned by Pillais, Tevars and Ambalakars in Kodiakadu and Agastiampalli.

In all the villages round Muthupet (i.e., Jambavanodai, Tillaivillaham, Vembalankadu, Sembankadu, Andiuttikadu, Melatundikadu, Keda Tandiakadu, Paddikorai, Peta, Sambaravankadu, Kelakadu) about 500 families of Ambalakaran and about 100 families of Harijans are available for daily labour. Carts are owned by Ambalakars and Tevars and boats by Labbais and Ambalakars.

Round Talanayar reserve in the villages of Avarikadu, Kallimodu, Naluvedapatti, Vellaipallam, Talanayar and Vandal villages, some 300 Padayachi, 50 Goundens and about 100 Ambalakaran families are available from whom labour for felling and other works could be drawn. Cartmen and boatmen are generally from Pillai, Tevar, Gounden and Ambalakaran castes.

Boats and carts can be had in sufficient numbers.

CHAPTER V.—PAST SYSTEM OF MANAGEMENT.

GENERAL HISTORY OF THE FORESTS.

37. The present revenue district of Tanjore in which the forests are situated comprises the territory ceded to the East India Company by treaty at the close of the eighteenth century with separate settlements of—

(1) Devikottai;
(2) Nagore, including Negapatam; and
(3) Tranquebar less the Kilanilei district.

The district has an area of 3,712 square miles and supports a population of 2,385,920. Thus with density of 638 per square mile, it is the most thickly populated district of the Presidency. It contains the smallest uncultivated area in any district.

38. The present area of the reserved forests *so far* has only been 10·5 square miles. Before Tanjore Range was abolished in 1914, there used to be the following reserved forests in the Tanjore district:—

	ACS.
Casuarina group—	
Shiyali taluk—	
Vattangudi mixed forest	2,010
Northern Casuarina block	285
Southern do.	210
Neiduvasal do.	42
Northern Casuarina extension	100
Tanjore group mixed—	
Tanjore taluk—	
Naduwur I	1,661
Naduwur II	334
Tachankurichi	520
Viralapatti North	147
Viralapatti South	190
Kollingarai	447
Puduvoor I	191
Puduvoor II	125
Tiruturaipundi taluk—	
Kodiakadu (mixed)	3,955
Talanayar (Mangrove)	3,055
Total area	13,272

Excepting the last two which were retained under departmental control, all were either disafforested or parcelled out and sold.

In addition to these reserved forests, there were twelve reserved lands, all of which except Muthupet, were handed over to the Public Works Department in 1915 (B.P.F. No. 48, dated 9th March 1914, B.P.F. No. 152, dated 26th October 1915, B.P.F. No. 807, dated 22nd December 1915).

Proposals have, however, recently gone up to Government to declare an area of (16,810 acres) about 26¼ square miles, as reserved forest. This will include the Muthupet reserved land and some additional area on the coast of the Palk Strait. But bulk of this new reserve will be covered by water, as a large lagoon had to be included to get in all the wooded bits of Mangroves without making the boundary lines very awkward.

39. *Administrative history of the forests.*—Talanayar and Kodiakadu were notified as reserved forests on 15th October 1888 and 2nd May 1892, respectively.

Muthupet block notified as reserved land under section 26 by the Collector on 12th September 1911 had an area of 7,682 acres. But in 1925 an area of 2,000 acres was excluded from it for extension of cultivation.

Originally Tanjore forests were in the Central Circle. But in 1911, they were transferred to the Southern Circle and when rearrangement of Circles took place in 1921 they were placed in the IV Circle in which they remained till 1926–27 when they were transferred to the V Circle now called the Coimbatore Circle.

In connexion with the classification of reserves in the Tanjore district, the Board decided that the Talanayar and Kodiakadu reserved forests in the Tiruturaipundi taluk, should go into Class II and be retained as reserves and placed under the direct control of the Collector of Tanjore. The Collector should, it was stated, manage the two forests with the assistance of a small forest staff and under the Working Plan prepared by the District Forest Officer, South Arcot cum Tanjore (B.P.F. Ms. No. 375, dated 22nd December 1916). This Working Plan was accordingly drawn up by Mr. Chengappa and sanctioned by the Board in B.P.F. Ms. No. 227, dated 10th June 1918.

The Tahsildar, Tiruturaipundi, and the Revenue Divisional Officer, Mannargudi, were declared forest officers and invested with powers of a Range Officer and District Forest Officer, respectively, in G.O. No. 273, Revenue (Special), dated 28th August 1918. Both these officers are under the administrative control of the Conservator of Forests, Coimbatore Circle, as regards forest matters.

Before this arrangement came into force in 1918, the forests were under the control of the District Forest Officer, South Arcot cum Tanjore.

In 1927, when the Tanjore forests were being transferred to V (Coimbatore) Circle, there was a proposal to re-transfer their control to the Forest Department. But a committee of officials (including Conservator, Mr. Whitehead) held by the Collector at Tanjore on 13th December 1927, unanimously voted, in view of the economy and adequate management, to let the forests continue to remain under the direct control of the Revenue Department. The same committee also recommended the re-classification of Kodiakadu into Class I and of Talanayar into Class III. Till then both these reserves were placed under Class II. These arrangements were approved in G.O. No. 791, Development, dated 30th April 1928.

PAST SYSTEM OF MANAGEMENT AND RESULTS.

40. *General.*—The forests mainly produce fuel, and provide fishing and grazing and a few items of the minor forest produce usually found in the coastal reserves. Except for some small posts and rafters from Kodiakadu reserve, no timber is available in the reserves.

41. *Position as regards the Working Plans.*—Each of the two forests (viz., Kodiakadu and Talanayar reserves) is covered by a separate Working Plan prepared by Mr. Chengappa (B.P.F. Ms. No. 227, dated 10th June 1918).

The silvicultural system prescribed in all cases was coppice with standards, but the rotation differed. For Kodiakadu, it was thirty years and for Talayanar and Muthupet Mangroves, it was twelve years. The number of standards also differed from 20 to 40 per acre.

42. *Past method of exploitation.*—Information available is very meagre and differs in respect of each forest. I will, therefore, deal with each item separately.

(*a*) *Fuel—Kodiakadu reserved forest.*—Prior to its reservation in 1892, this area used to be under the Revenue Department, when on payment of Re. 1, a man could get permit to remove in the course of a year, whatever forest produce he wanted for his bona fide domestic and agricultural requirements. There was one amin on Rs. 12 with two watchers on Rs. 5 per mensem each to supervise the removals.

After its reservation in 1892 till 1907–08, the Forest Department used to issue permits at 1 anna per head-load and Rs. 1–4–0 per cart-load for dry fuel under the supervision of a forester (on Rs. 15), 1 forest guard (on Rs. 8), 2 reserve watchers (at Rs. 4) and 4 tanadars (on Rs. 4 each per mensem). In 1907–08 for the first time a coupe (Coupe I) was felled here and the other coupes worked were as follows :—

Coupe VIII in 1908–09.	Coupe V in 1915–16.
,, VII in 1913–14.	,, IV in 1916–17.

In 1908–09, however, when it was proposed to work this forest systematically under the Coppice with Standard System, according to the provisions of a reconnaissance report, a number of objection petitions were received by the Board of Revenue from the residents of Vedaranyam and Kodiakadu; whereupon the Board directed in B.P.F. Ms. No. 219, dated 10th March 1908, that the experiment of regenerating these forests on the Coppice with Standard System should be confined to a single coupe and that no more coupes should be touched till the results of the proposed attempts at regeneration in the first coupe were observed.

In accordance with the Board's orders, Coupe VIII of 135 acres was felled in the year 1908–09.

In 1911, on Mr. Peake's report, the Board agreed in B.P.F. Ms. No. 755, dated 15th May 1911, to continue the Coppice with Standard System in this reserve. The Collector of Tanjore, however, reported that the results in Coupe VIII did not appear to be encouraging as Palai stumps (the main species of the reserve) were not seen to be coppicing well and that the shoots which came up did not thrive on account of damage done by animals, the hot and sandy nature of the soil and the extreme draught; the unsatisfactory results were mostly attributed to the impossibility of keeping out wild pigs and deer.

Mr. Peake ordered some experimental fellings to be carried out on a 10-acre plot in Coupe VII to see whether Palai could coppice satisfactorily. There was another plot of 3½ acres opened in Coupe VII in 1912 and the resultant fuel supplied to the officers of the Salt Department stationed at Vedaranyam. (Conservator's Office R. Dis. No. 37/17.)

Nothing, however, is known about the lines on which the experiments in these plots were carried out or of the results arrived at.

But the balance of Coupe VII (i.e., 135—13½ acres was sold in 1913 with a " voidah " till 30th June 1914. Coupes V and IV were felled in 1915–16 and 1916–17, respectively. But when Coupe III was due for the axe in 1917–18 it was, on account of an objection raised by the Salt Department, ordered by the Collector not to be felled. Instead the right to remove dead-wood from the whole reserve was leased out for Rs. 1,010 for a period of six months from 20th June 1917.

The following note is copied from Mr. Chengappa's Working Plan from Chapter I, section 6 (*b*) Fuel. : " The first attempt at coupe fellings was made in 1907–8 under a reconnaissance plan when an area of 135 acres was put up for sale. One of the local mirasdars took up the lease for Rs. 500 and would not work the area as a protest but paid the amount. The area was again sold in 1908–09 at the low rate of Rs. 4–4–0 per acre, to break the strong combination of the local mirasdars against coupe workings. They managed to enlist the sympathies of the Government Salt Factory at Vedaranyam and after much correspondence with the authorities up to the Board, the contractor managed to get through his work, in spite of much local opposition, by getting all the labour from Tanjore. For the next three years, i.e., from 1909–10 till 1911–12 coupe-fellings were suspended under orders of the Board in deference to much local mistaken opposition when experimental areas of 1/5 acre in 1910–11, 10 acres in 1911–12 and 3½ acres in 1912–13 were felled for observation to see whether really there was any danger of the area becoming a sand waste by coppice fellings, as greatly feared by the local mirasdars, on account of their vested interests in the large valuable tobacco cultivation to the north and west of the area.

By 1913–14, the local opposition cooled down much, no doubt allayed by the result of the experimental coppice fellings which so far as Kasan was concerned was an unqualified success."

From 1918, Mr. Chengappa's plan is in force and Coupe XVII has been sold this year (1934).

(*b*) *Talanayar reserved forest.*—Prior to reservation in 1888, it appears, that the surrounding villagers were allowed to remove all their requirements free from this area.

After reservation, dead-wood was allowed to be removed on permits at 1 anna per head-load and Re. 1–4–0 per cart-load, respectively.

In 1908–09, however, coupe system was introduced under a reconnaissance report and Coupe X was worked.

Coupe IX was not worked on account of poor growth. The other coupes were worked as follows :—

Coupe VIII in 1911–12.
,, VII and VI in 1912–13.
,, V in 1913–14.
Coupe IV in 1914–15.
,, III in 1915–16.
,, II in 1916–17.

Mr. Chengappa's Working Plan, however, gives a slightly different account (vide Chapter I, section 6) as follows :—

> " This (i.e., permit) system continued till about 1904 and 1905, when first located coupe-fellings were started and an area of 100 acres under a reconnaissance plan in Coupe X was sold at about Rs. 5 per acre. Till 1911–12 no further coupes were worked, as Coupes IX and VIII did not contain any growth fit for felling and the contractors to whom the areas were sold in auction entered into litigation with the department. From 1912–13 onwards coupes have been regularly worked as follows :—

1912–13 coupes 7 and 6, 200 acres for Rs. 710.
1913–14 coupe 5, 100 acres for Rs. 330.
1914–15 coupe 4, 125 acres for Rs. 738.
1915–16 coupe 3, 52 acres for Rs. 702.
1916–17 coupe 2, 100 acres for Rs. 462.

The area of the above coupes included large blanks which covered more than about four-fifths of the total area. During 1916–17, the original contractor having died before the issue of the confirmation order, the net area containing growth 16½ acres was resold for Rs. 231 at Rs. 14 per acre."

From other records (Conservator's R. Dis. No. 37/17), it appears, however, that Coupe X was worked in 1908–09 (and not in 1904–05) while Coupe IX was not worked at all on account of poor growth and Coupe VIII was worked in 1911–12.

Mr. Chengappa's Working Plan came into force from 1917–18. The method prescribed was Coppice with standards on a twelve years' rotation with 30 standards per acre.

Only 11 coupes were felled, as Coupe XII did not contain growth and was left out, so the first rotation practically came to a close with the felling of Coupe XI in 1928. After that, there were no fellings for three years due to a misunderstanding on the part of the Revenue Divisional Officer, who thought that as the reserve was transferred to Class III (in 1928) it could not be worked for fuel.

From 1931, however, coupes are being felled under second rotation. The following coupes have been worked :—

	Coupe.		Coupe.
1931	III	1934	V (under felling)
1932	IV and XII *		
1933	II		

Note.—* Coupe XII is reported by the Tahsildar, Tiruturaipundi, to have been felled under the verbal orders of Conservator Mr. K. R. Venkataramana Ayyar given at the time of his inspection.

These coupes are being felled according to the sequence of felling suggested by Mr. Whitehead and approved in C.C.P. No. 149, Press, dated 15th March 1930 and given below :—

	Coupe.		Coupe.
1931	III	1937	VIII
1932	IV	1938	IX
1933	II	1939	X
1934	V	1940	XI
1935	VI	1941	I
1936	VII		

Note.—The coupes worked before the introduction of Mr. Chengappa's Plan and those of his Working Plan do not coincide but are widely different.

(c) *Muthupet reserved land.*—Till about 1910–11, the entire area of the Government forest, with certain adjoining chatram waste land, was under the control of the chatram branch of the District Board Department, when owing to a dispute among Umri (Suaeda species) contractors, the correct boundary between the Government and chatram lands was demarcated.

This demarcation is known as A to C line according to Mr. Thornhill's decision No. 1 of 1911.

Note.—Chatram department is a branch of the District Board which looks after the endowments made by the old rulers for maintaining chatrams (rest-houses) constructed for the convenience of pilgrims going to Rameswaram and other Hindu shrines.

The Government portion of 7,682 acres, was notified by the Collector on 12th September 1911 as reserved land.

Note.—Out of 7,682 acres, 2,000 acres were, however, set apart by the Collector in 1925 for the extension of cultivation.

Till 1911, the Chatram department which had the control of the area used to issue permits for the removal of dead-wood only.

From 1911–12, when the area came under the control of the Revenue Department, systematic coupe-fellings were introduced and up to 1916–17, the following areas were sold :—

1911–12 " A " 49·33 acres at 9 per acre.
1912–13 " B " 56·00 acres at 20 per acre.
1913–14 " C " 88·6 acres at 13 per acre.
1914–15 " D " 89·00 acres at 59 per acre.
1915–16 " E " 26·20 acres at 84 per acre.
1916–17 " F " 24·26 acres at 60 per acre.

[These bits A to F correspond to portions of the present (1918 Working Plan) Coupes VII, IX and XII.]

From 1st July 1923, the control of Muthupet block was handed over to the Chatram department by a written agreement according to which that department was to control the expenses and get a moiety of the net revenue as supervision charge. This agreement was in the first instance for three years (G.O. Ms. No. 575, dated 23rd April 1923), then it was extended for a further period of five years (G.O. Ms. No. 1409, Development, dated 27th September 1926) and again for one year from 1st July 1931 to 30th June 1932 (G.O. No. 1362, Development, dated 11th September 1931). But the forest was resumed by the Revenue Department from 1st July 1932 (G.O. Ms. No. 864, Development, dated 26th June 1932) as the Chatram department did not agree to the proposals made by the Collector to reduce the disproportionately large supervision charges claimed by the former.

Under Mr. Chengappa's Working Plan, the forest was to be worked under the Coppice with Standard System on a twelve years' rotation with 40 standards per acre. And only 1,113 acres, containing some 627 acres of wooded area, were included in the felling series.

Presumably the prescriptions of the Working Plan were not strictly followed during the period the forests were under the management of the Chatram department. Because in January 1930, when Mr. Whitehead (Conservator, V Circle) inspected this forest, he found fellings going on simultaneously in three coupes (Coupes IX, XI and VI), which were all sold in the first-half of the year 1929 and what was still worse, Coupe VI was being worked out of its turn for fellings (C.C.P. No. 149, Press, dated 15th March 1930), though it must have been felled according to the Working Plan only in 1923.

The sequence of felling recommended by Mr. Whitehead and approved in Chief Conservator's Proceedings quoted above was :—

	Coupe.		Coupe.
1931	XII	1937	VIII
1932	I	1938	X
1933	III	1939	IX
1934	IV	1940	XI
1935	V	1941	VI
1936	VII		

Note.—Mr. Whitehead had stated that Coupe II will not be fit for felling when its turn came in 1933, so this coupe was not sold.

After resumption of charge of the forests by the Revenue Department, only one coupe (Coupe I—area 31·02 acres) has been sold for Rs. 400 in 1933. Coupe III, which was to be felled in 1934, could not be sold partly, because the area is distant but chiefly, because the Chatram department has leased out two coupes in the Chatram forest in the year.

For other items reference is invited to paragraphs 29 to 31 (Part I, Chapter III).

SPECIAL WORKS OF IMPROVEMENT UNDERTAKEN.

43. *Statement showing the special works of improvement undertaken*—

Year.	Kind of work.	Amount spent.			Remarks.
		RS.	A.	P.	
1926–27	Repairs to bunds	126	0	0	
	Repairs to the rest-house	133	6	0	
1923–24	Repairs to the shed in front of rest-house	39	0	0	
1929–30	Repairs to the kitchen of the rest-house	131	11	0	
1930–31	Fencing of worked Coupes IX to XII	150	0	0	
	Construction of shed in Coupes XII and XI	10	0	0	
	Repairs to the bunds	65	0	0	
1931–32	Sowing in Coupes XII and XIV	20	0	0	120 Portia cuttings planted.

Year.	Kind of work.	Amount spent. RS.	A.	P.	Remarks.
1931–32 —*cont.*	Construction of a temporary shed in coupe XIII	2	4	0	
	Repairs to the rest-house and its kitchen	100	0	0	
	Repairs to the thatched shed in front of bungalow ..	5	0	0	
1932–33	Sowing	5	0	0	
	Repairs to the bunds	25	0	0	
1933–34	Repairs to the bunds Kodiakadu Reserved Forest	100	0	0	
	Sowing in coupe No. XV	20	0	0	120 Portia cuttings planted and 4,000 palmyra seeds sown.
	Water cart for rest-house	100	0	0	
	Construction of a boat for use in backwaters of Muthupet reserved land	415	0	0	

Note.—All works, except only the last item, relate to Kodiakadu Reserve.

PAST YIELD.

44-A. *Statement showing the past yield and particulars of prices obtained for coupes in Tanjore forests for the last ten years from 1924–25*—

Name of series. (1)	Coupe number. (2)	Year of felling. (3)	Wooded area (only) in acres. (4)	Prices realized for the coupe. (5)		Price per acre. (6)		Total yield in tons. (7)	Yield per acre in tons. (8)	Remarks. (9)
				RS.	A.	RS.	A.	Tons.	Tons per acre.	
Kodiakadu ..	VIII	1925–26	57·00	1,250	0	21	15	*		
	IX	1926–27	56·35	810	0	14	6			
	X	1927–28	54·92	1,710	0	31	1			
	XI	1928–29	60·00	1,180	0	19	11			
	XII	1929–30	57·00	1,230	0	21	9			
	XIII	1930–31	57·00	475	0	8	5			
	XIV	1931–32	65·00	800	0	12	4			
	XV	1932–33	64·00	850	0	13	4	599½	9·4	
	XVI	1933–34	75·00	650	0	8	11	610	9·4	
	XVII	1934–35	64·00	660	0					
Talanayar ..	VIII	1925–26	29·00	350	0	12	1	*		
	IX	1926–27	34·00	410	0	12	1			
	X	1927–28	34·95	325	0	9	5			
	XI	1928–29	31·00	310	0	10	0			
		1929–30	No sale.							
		1930–31	No sale.							
	III	1931–32	19·00	160	0	8	7			
	IV	1932–33	22·83	150	0	6	9	190	9·3	
	XII	1932–33	30·00	40	0	1	5	22	1·4	
	II	1933–34	32·00	136	0	4	4	172½	5·4	
	V	1934–35	29·00	114	0	..				
Muthupet ..	..	1924–25								
		1925–26								
	VII VIII	1926–27	96·60 65·94 52·00	910	0	8	5	*		
	XI	1927–28	42·40	905	0	21	5			
		1928–29		1,290	0					
	IX	1929–30	47·71	1,200	0	25	2			
		1930–31								
	XII	1931–32	56·25	822	0	14	10			
		1932–33		62	8					
	I	1933–34	31·02	400	0	12	14	484	15·6	

* Yield figures for these years not available.

Note.—As stated under Chapter VI statistics of yield, yield figures are not available for other coupes.

PAST REVENUE AND EXPENDITURE.

44-B. *Statement showing the past revenue realized on different kinds of minor forest produce from 1931–32*—

	1931–32.	1932–33.	1933–34.
Kodiakadu Reserved Forest.	RS.	RS.	RS.
Grazing and fodder grass	575	593	497
Nandi and Umri	(Included under Talanayar)		
Other minor forest produce	75	88	61
Total ..	650	681	558
Talanayar Reserved Forest.			
Grazing and fodder grass	310	308	271
Nandi and Umri	400	265	110 *
Other minor forest produce including fishing	1,250	1,100	805
Total ..	1,960	1,673	1,186
Muttupet.			
Grazing	..	..	..
Nandi and Umri	300	200	200
Other minor forest produce including fishing	1,322	1,220	610
Total ..	1,622	1,420	810

* Includes revenue for Kodiakadu also.

Past Revenue and Expenditure from 1931–32.

Head of account.	1931–32.	1932–33.	1933–34.
	RS.	RS.	RS.
Revenue.			
Timber, etc., removed by consumers—			
Forest department—			
Timber	..	..	..
Firewood and charcoal	1,018	1.457	957
Grazing and fodder grass	865	901	769
Other minor produce	937	1,943	2,923
Total	2,820	4.301	4,649
Revenue Department—			
Timber	336	6	76
Firewood and charcoal	2,385	3,362	3,849
Bamboos	..	..	2
Other minor produce	2,327	2,564	2,780
Total	5,048	5,932	6,707
Drift and waifwood and confiscated produce	4	2	3
Miscellaneous—			
Fines and forfeitures	..	..	..
Rents of buildings	11	11	27
Other sources	6,420	4,343	3,490
Total	6,431	4,354	3,517
Grand total	14,303	14,589	14,876
Deduct refunds	8	17	10
Expenditure.			
I. Government Agency—			
Timber	2	..	..
II. Timber, etc., removed by purchasers	250	251	263
III. Renewals and replacement of stores	7	35	3
Buildings	213	125	120
IV. Maintenance of boundaries	9	25	..
Regeneration	20	..	..
Other items	..	..	115
Miscellaneous	11	..	..
Total	512	436	501
5 2-A. Capital—Outlay on forests—			
Demarcation	3	..	..
Purchase of stores	..	..	509
Total	3	..	509
Establishment—			
Pay of establishment—Permanent	1,009	1,384	1,200
Travelling allowance—Voted	30	57	51
Fixed travelling allowance	114	105	105
Service postage and telegram charges	100	100	100
Office expenses	..	..	7
Miscellaneous charges	..	..	1
Total	1.253	1,646	1,464
Abstract of Revenue and Expenditure.			
Total revenue	14,303	14,589	14,876
Deduct refunds	8	17	10
Net revenue	14,295	14,572	14,866
Total expenditure	1,768	2.082	2,474
Next surplus	12,527	12,490	12,392
Annual average surplus for three years	12,470	..	..

CHAPTER VI.—STATISTICS OF GROWTH AND YIELD.

A. STATISTICS OF GROWTH.

45. (i) *Rate of growth of Alayathi* (*Avicennia officinalis*).—Alayathi (Avicennia), the only important species of the Mangrove, does not coppice and so the rates of growth of the coppice cannot be known.

Measurements of trees in the felled coupes are liable to give erroneous idea as to the rate of growth. Because much of the crop is from advanced growth of uncertain age left uncut at the time of the main fellings.

From the ring countings it is equally difficult to determine the correct rate of growth, as number of rings are seen on a cut stump which are obviously not annual rings. It seems probable that every year three such rings are formed and on this basis it is presumed that the rate of growth in girth in the case of Avicennia is about ¾ inch per annum.

Over three thousand measurements of heights and girths were taken but they could only be utilized for fixing the sequence of fellings for reasons already stated. Original records of measurements are filed in the Conservator's office.

(ii) *Rate of growth of species other than Mangrove.*—Several hundred measurements of coppice shoots at the rate of between 50 and 100 measurements for each species for coupe in coupes I to XV of Kodiakadu were taken and the result shows that rate of growth in this hot, sandy and infertile tract, is extremely slow. The average girth at breast height (heights are given within the brackets) attained in 15 years by some of the species measured are noted below :—

Memecylon edule	3·54 inches	(12·00 feet)
Dichrostachys cinerea	5·58 ,,	(10·46 ,,)
Flacourtia ramontchi	3·69 ,,	(11·20 ,,)
Gmelina asiatica	5·04 ,,	(10·04 ,,)
Cassia fistula	10·38 ,,	(9·75 ,,)
Maba buxifolia	4·0 ,,	(11·30 ,,)

The record containing average and annual girth and height measurements of number of shoots per stool of the above, as well as of several other species, have been filed in the Conservator's office and will be available for reference.

B. Statistics of Yield.

The area (Kodaikadu Reserve) has hitherto been worked under coppice with standard. But it is unfortunate that no statistics relating to yield from the coupes felled year after year have been maintained. It is only within the last two or three years that any attempt has been made to maintain an account of the yield. But some idea may be gained of the yield, from the amount of revenue realized per acre in the past.

The subjoined statement shows the revenue realized wherever figures are available :—

Block. (1)	Coupe number. (2)	Year. (3)	Area of the coupe wooded portion. (4)	Rate per acre of the wooded area. (5)	Yield in tons per acre. (6)	Remarks. (7)
			ACS.	RS. A.		
Kodiakadu	VIII	25–26	57	21 15		*
	IX	26–27	56·35	14 6		
	X	27– 8	54·92	31 1		
	XI	28–29	60	19 11		
	XII	29–30	57	21 9		
	XIII	30–31	57	8 5		
	XIV	31–32	65	12 4		
	XV	32–33	64	13 4	9½ tons	As per the control returns.
	XVI	33–34	75	8 11	8 tons	
			546·5	Average rate = Rs. 16–6–0.		
Talanayar	VIII	25–26	29	12 1		*
	IX	26–27	34	12 1		
	X	27– 8	34·95	9 5		
	XI	28–29	31	10 0		
	..	..	No sales for two years.			
	..	..				
	III	31–32	19	8 7		
	IV	32–33	22·83	6 9	8 tons	As per the control return,
	XII	32–33	30	1 5	¾ tons	
	II	33–34	32	4 4	5½ tons	
			233	Average per acre 8–1–0.		
Muttupet	VII	26–27	96.6	8 5		*
	VIII	26–27	65·94	8 5		
	X	26–27	52	8 5		
	XI	27–28	42·4	21 5		
	IX	29–30	47·71	25 2		
	XII	31–32	56·25	14 10		
	I	33–34	31·02	12 14	15½ tons	As per the control returns.
			392	Average 13 per acre.		

* Figures not available for these years.

CHAPTER VII.—ESTIMATE OF THE CAPITAL VALUE OF THE FORESTS.

46. No attempt has been made to calculate the capital value of the forests as such figures would serve no useful purpose. But the value of these forests as preventive of sand drifts cannot be overestimated.

PART II.

Future Management discussed and prescribed.

CHAPTER I.—BASIS OF PROPOSALS.

General Objects of Management.

47. (1) To exploit firewood, under suitable Silvicultural methods of treatment.

(2) To exploit Minor Forest Produce with particular reference to the local demands, so long as they are not prejudicial to the forests.

(3) To realize equal and sustained yield and to maintain the forests in a state of increasing productivity.

(4) To supply, as far as principles of conservancy allow, the grazing of requirements of the villages bordering on the forests.

(5) To protect such areas as are uneconomical to work at present or are required for their indirect climatological or physical benefits.

Method of Treatment to be adopted.

48. For the *Avicennia* forests of Talanayar and Muthupet, due to the inability of the species to coppice, Clear-felling system with the reservation of a few well-distributed seed bearers is prescribed. While for the Kodiakadu Reserved Forest simple coppice is being adopted.

The rotation to be adopted and other details will be discussed under the respective Working Circles.

49. The exploitation will be, as a rule, by the agency of contractors except that grazing and shooting will be allowed on permit system. Each Reserve will form a unit by itself for the purpose of exploitation.

Working Circles, their Area and Distribution; Reasons for their constitution.

50. In pursuance of the objects set forth above, there will be five Working Circles :—

(1) Clear Felling,
(2) Simple coppice,
(3) Protection,
(4) Minor Forest Produce, and
(5) Grazing.

Each will be discussed in its proper place.

51. The subjoined statement shows the distribution of the various Working Circles :—

Working Circle.		Distribution.			
Serial number and name.	Extent in acres.	Reserves.		Number of series.	Remarks.
1 Clear Felling Working Circle.	1,663 (Wooded area).	Talanayar .. Muthupet ..	314·0 acres 1,349·0	2	
2 Simple Coppice Working Circle.	1,977* acres of which 1,262 are wooded.	Kodiakadu (portion).	1,262 acres (wooded only).	1	* This does not include the 60 acres set apart for the railway line but includes about 715 acres of blanks.
3 Protection Working Circle— Kodiakadu, 1,978 Talanayar 2,741 Muthupet 15,461	20,180 ..	Portions of all three reserves not included under 1 and 2		1	
4 Grazing Working Circle.	23,820 ..	Kodiakadu .. Talanayar .. Muthupet .. (except closed coupes.)	(3,955 acres) .. (3,055 ,,) (16,810 acres)	1	All three reserves will constitute one grazing Working Circle. But as prescribed by G.O. Ms. No. 802, dated 11th June 1932, grazing in all reserved forests will be allowed only for those cattle for which permits at highest sanctioned rate for the district have been purchased (highest rate being Re. 1 per cow for Talanayar Reserved Forest).
5 Minor Forest Produce Working Circle.	23,820 ..	Kodiakadu .. Talanayar .. Muthupet ..	3,955 acres .. 3,055 ,, 16,810 ,, 23,820 ,,	3	

The Period of the Working Plan and Necessity for intermediate revision.

52. The plan will be in force for a period of ten years from April 1935 to March 1945.

Due to the changing character of the crop in the mangroves and the expected extension of the Tiruturaipundi-Agastiyampally Railway line to Point Calimere, it would be advisable to revise this plan at the end of ten years' period.

CHAPTER II.—WORKING PLAN FOR THE MANGROVE CLEAR-FELLING WORKING CIRCLE.

GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

53. *Constitution of the working circle.*—The working circle covers the mangrove forests of Talanayar and Muthupet.

54. *The species found.*—*Avicennia officinalis* (Alayathi) predominates in both the forests and is the only species that need be considered. *Excœcaria agallocha* (Tillai) which is not liked as fuel for domestic purpose, due to its acrid smoke (though it is prized in some places for burning tiles to which it gives good colour) is found in narrow strips here and there mainly in localities where stream banks or the general level of the ground has risen up beyond the influence of tides.

There is one solitary bush of *Rhizophera Macronata* in Talanayar standing in the Addapar river near the lagoon.

Aegiceras majus occurs as undergrowth. It is very abundant in Talanayar. In Muthupet, however, it is very common. Its value as a good fuel species is not known in these parts.

Clerodendron inerme (Peekalati) is another shrub which is very common in both Talanayar and Muthupet. Its leaves are supposed to be good for green manure.

Acanthus illicifolius (Mulli, the Sea Holly) is a common pest along the banks of creeks and rivers and in some places monopolises the ground for several feet along both banks of a stream to the exclusion of every other species.

Suæda species found are :—

Suæda monoica (Umri) and *Suæda mudiflora* (Nandi). The latter is less common.

55. *The general character of the vegetation.*—Growth is found only along the edges of water-courses to a norrow width. Blanks both within the wooded area and outside it, are numerous, and with creeks and lagoons, form $\frac{3}{4}$ to $\frac{7}{8}$ of the gross areas of the mangrove reserves.

Avicennia officinalis (Alayathi) occurs gregariously. But the stock in the worked coupes differs in density, height and girth, even on comparatively small areas and the growth is very irregular with standards dotted here and there.

56. *In Talanayar Reserved Forest*, the growth of all ages, young and old, is jumbled up together on the same area, while in Muthupet young crops form distinct and separate belts. This is probably due to the fact that the sea is very far (over 10 miles) from the land-locked mangrove of Talanayar and the action of the tides, by the time the latter reach this reserve, becomes too weak to form new accretions or to raise the general level of the ground perceptibly. So, unlike other mangroves, physical changes in this reserve are neither frequent nor very appreciable and the growth is, more or less, perpetuated on almost the one and the same area year after year.

57. In Muthupet forest, however, where due to the proximity to the sea, tidal action is very strong, new accretions are constantly being formed. Though the growth is irregular yet each age class forms a zone of its own, the youngest being nearest the water edge and the oldest farthest away from it. While the new accretions are forming and young crops are added, the oldest crop in the back ground, due probably, to the general rise in the ground level, becomes stag-headed and open and dies by stages eventually. This is a common phenomenon in older coupes, e.g., I, III, IV, V and VI of 1918 Working Plan. Where one finds rows of dead stumps, then a row of dead trees half gone, then rows of dying and stag-headed trees with very open canopy, then the growth of healthy trees, comparatively older, and so on till one comes to the youngest growth near the water edge.

58. In Muthupet on both banks of the river Koriar from its mouth (where it empties itself into the Mullipallam lagoon) for about a mile or so up-stream, there is one of the finest virgin patches of the mangrove in the Presidency on an area of about 70 acres, flooded on the North and East and South by the lagoon. Under the orders of the Conservator (Mr. F. R. Madan) a plot of 9·6 acres has been laid out for permanent retention, preservation of such types having been recommended by the Third Silvicultural Conference (1929) in its resolution No. 22 item (3).

BLOCKS AND COMPARTMENTS.

59. *Subdivision of the Clear-felling Working Circle into Felling Series.*—This working circle will be divided into two felling series—

(1) Talanayar Clear-felling Series (314 acres wooded), and
(2) Muthupet Clear-felling Series (1,349 acres wooded).

Note.—Muthupet and Talanayar Blocks are 30 to 35 miles apart and have independent sources of labour supply.

ANALYSIS AND VALUATION OF THE CROP.

60. No detailed analysis of the crop was carried out as it is unnecessary for these fuel areas. But during the survey a note was made about the density, and large number of height and girth measurements were taken throughout the wooded area of both the blocks, in order, as far as possible, to put them in their proper felling sequence.

The wooded areas as shown in the stock maps were fixed by actual survey.

61. *Valuation of the crop.*—In view of the fact that no useful purpose would be served by attempting to calculate figures without accurate data, valuation of the crop has not been done.

METHOD OF TREATMENT.

62. The Silvicultural system will be clear-felling with reservation of 20 to 25 trees per acre as seed bearers. This is prescribed, as the most common and at the same time most valuable species (Avicennia), does not coppice, and we have to rely on natural regeneration from seeds.

63. *Rotation.*—The rotation has been fixed at twenty years.

There is no data available for mangroves for the scientific calculation of the rotation which therefore has been fixed on general grounds, mostly on the basis of the sizes of firewood in demand locally for domestic and kiln use.

64. *Division into coupes.*—Each felling series has been divided into twenty coupes, one of which is to be worked in sequence, every year, vide the following tabular statement.

65. *Tabular statement of fellings*—

Year of working.	Coupe No.	Talanayar Clear Felling Series.	Muthupet Clear Felling Series.	Remarks.
		Wooded area in acres.	Wooded area in acres.	
(1)	(2)	(3)	(4)	(5)
1935–36	I	14·0	86·0	Sequence of coupes has been fixed according to the maturity of the growth. Coupes are, therefore, not necessarily contiguous.
1936–37	II	17·0	82·0	
1937–38	III	16·0	67·0	
1938–39	IV	16·0	56·0	
1939–40	V	16·0	58·0	
1940–41	VI	14·0	58·0	
1941–42	VII	17·0	60·0	
1942–43	VIII	15·0	46·0	
1943–44	IX	15·0	101·0	
1944–45	X	15·0	48·0	
1945–46	XI	17·0	63·0	
1946–47	XII	14·0	64·0	
1947–48	XIII	17·0	72·0	
1948–49	XIV	20·0	57·0	
1949–50	XV	17·0	64·0	
1950–51	XVI	16·0	63·0	
1951–52	XVII	14·0	78·0	
1952–53	XVIII	16·0	76·0	
1953–54	XIX	14·0	76·0	
1954–55	XX	14·0	74·0	
Total		314·0	1,349·0	

66. *Yield.*—The yield will be regulated by area.

METHOD OF EXECUTING THE FELLINGS.

67. *Clear Felling Working Circle*—One coupe will be felled in each Felling Series every year through the agency of a contractor.

68. Coupes shall be sold in public auction every year at so much per acre.

69. The lease will run from 1st April to 31st March of the next year.

70. The sales should be advertised in the December issue of the District Gazette and held not later than the beginning of February each year.

71. Coupes remaining unsold at the original sale but sold subsequently will be leased only for the period ending on 31st March.

72. The coupe to be felled will be surveyed and demarcated on the ground by a cut line 10 feet wide, with reference to the Working Plan map, in the month of November of

the year previous to the felling. A plan of each coupe on a scale of 8 inches = 1 mile, with strips and their areas marked, should be ready before the date of sale with details showing the bearing and distances of the boundary lines in red and black ink respectively. A copy of this plan should be attached to the agreement.

73. Area arrived at by the actual survey will be adopted for the lease. Difference between the nominal area shown in the Working Plan and the area computed by actual survey will not constitute a deviation requiring special sanction unless there is change in the boundaries as well.

74. If a coupe is more than 20 acres in extent, it should be divided by cut lines into a convenient number of strips of approximately equal size (generally of not more than 20 acres each). But if a coupe is naturally subdivided by creeks or blanks, lines need not be cut, though areas of strips may differ.

75. Fellings should proceed systematically from one end of the coupe and working in patches here and there should never be allowed.

76. Fellings should be completed in one strip before the next is taken up.

77. The order, in which strips should be taken up for fellings, is left to the discretion of the Revenue Divisional Officer, but should be marked on the sketch attached to the agreement.

78. Portions left unfelled at the close of the lease will be surveyed and the area computed and sold, of choice, to the current year's contractor. In which case he should be made to first fell the arrear area before the current year's coupe is taken up. The rate to be fixed by the Revenue Divisional Officer to be either the rate realized for the coupe originally or the rate at which current year's coupe is sold.

79. The work of coolies should be supervised either by the contractor or by an authorized agent of his.

80. Firewood shall be heaped in stacks of uniform dimensions before it is allowed to be removed (the usual local size of a stack is 6 feet × 3 feet × 3 feet).

Felling Rules.

81. Trees marked as seed bearers shall not be felled.

82. No Alayathi seedlings less than 3 inches in girth at base will be felled.

83. No coppicing of stumps is necessary.

84. The contractor will not be allowed to block up, by throwing brushwood, etc., any creek, big or small, that may be passing through the coupe or along any boundary of it. This is important, as natural regeneration of Avicennia depends on the free flooding of the felled area and so this condition must be enforced always.

SUBSIDIARY SILVICULTURAL REGULATIONS.

85. Climbers are few. Occasionally Derris scanders is found on some trees and if such trees are selected as seed bearers the climbers should be cut at the time of marking them for retention.

86. Umri (Suaeda) was uprooted by the Conservator's orders to see if the seedlings of Alayathi (Avicennia) would be benefited by the operation. But Avicennia seedlings thus freed died of sudden exposure.

Avicennia though a light-demander tolerates shade, provided it is not too dense, in its seedling stage. It prefers lateral sun light in that stage. It is a common sight to see Alayathi (Avicennia) seedlings coming up in blanks under Suaeda where nothing but suaeda can grow. So Umri (Suaeda) helps rather than hinders Alayathi growth. Further Suaeda is one of the saleable items of the minor forest produce. It need not therefore be destroyed.

87. *Acanthus illicifolius.*—It is a pest on banks of streams, especially where there is no tree growth, and monopolizes the ground to a width of several feet. It is not controlled by cutting back. I have seen areas where it was cut back by the Public Works Department along the Koriar some time back; but, if anything, it is coming up more vigorously on the area. Uprooting it is out of the question on account of the high cost which works out from Re. 0–8–0 to Re. 0–12–0 per 100 square feet. Fortunately except in a few places, e.g., along the Addapar in Talanayar and along the Koriar and Chetuguda voikal, etc., in Muthupet it is not a great nuisance in our forests.

Introduction of tree growth in blanks.

88. Blanks are of two kinds :—

(*a*) Areas where Umri (Suaeda) grows.

(*b*) Blanks (salt pans) where even Umri (Suaeda) cannot grow.

(i) The former are either areas where previously Alayathi (Avicennia) growth was standing but due to the rise in the general level of the ground or other causes it gradually disappeared, or

(ii) they are areas where blown sands have laid a sufficiently thick layer of sand on the salt swamps, or pans, to allow Suaeda to come up.

Any attempt on our part to generate tree growth in blanks of any of the abovementioned kinds will be much too costly and yet uncertain of success. So no attempt will be made to afforest them artificially.

89. It is suggested, however, that Alayathi seed may be sown in suitable localities experimentally. The method of collecting seeds and sowing them with names of some suitable localities where the seed could be tried is given below.

90. *Avicennia officinalis (Alayathi).*—Flowers available from June to August, and fruit, which is a compressed one-sided capsule, from August to November. Fruit ripens from October onwards.

91. The seed germinates immediately it falls or even on the tree.

92. The seeds are buoyant and are thus able to spread by the agency of water. From about October onwards, seeds will be seen floating on the surface of the water and most of these will be found to be germinating.

93. *Method of collecting the seed.*—To collect the seed for artificial regeneration the best method is to drag with a small net and to throw the seed into a boat partly filled with water which should then proceed straight to where the seed is to be sown, *the seed being sown broadcast without delay*—the best time being between new moon and full moon when the tides are lowest. The sowing is done when the tide has run out and there is no water on the ground, otherwise there is danger of the seed floating away. As a further precaution, the seed should be pressed down with feet in the same way as puddle is made. The site selected for artificial regeneration must be such as is frequently flooded by tides and there should not be dense low overhead cover, as this is not tolerated by the seedlings.

94. Names of some of the suitable localities where Alayathi can be tried artificially is given below :—

(*A*) *Muthupet*—

(i) On the lagoon-side edge of the existing Avicennia growth and for a width of ½ chain from the latter (growth).

(*a*) between cairns 34 and 36.

(*b*) from cairn 37 all along the existing growth right up to north-east boundary of coupe VI on the Cheduguda voikal.

(ii) Along the southern boundary of the reserve along the sea-shore between cairn 32 and 32-T.

(iii) Between 32/S and 32/M.

(*B*) *Talanayar Reserved Forest*—On the eastern side of the existing Avicennia growth of

(i) Coupes XX, XV, XVI, V, VI, to the width of a quarter chain,

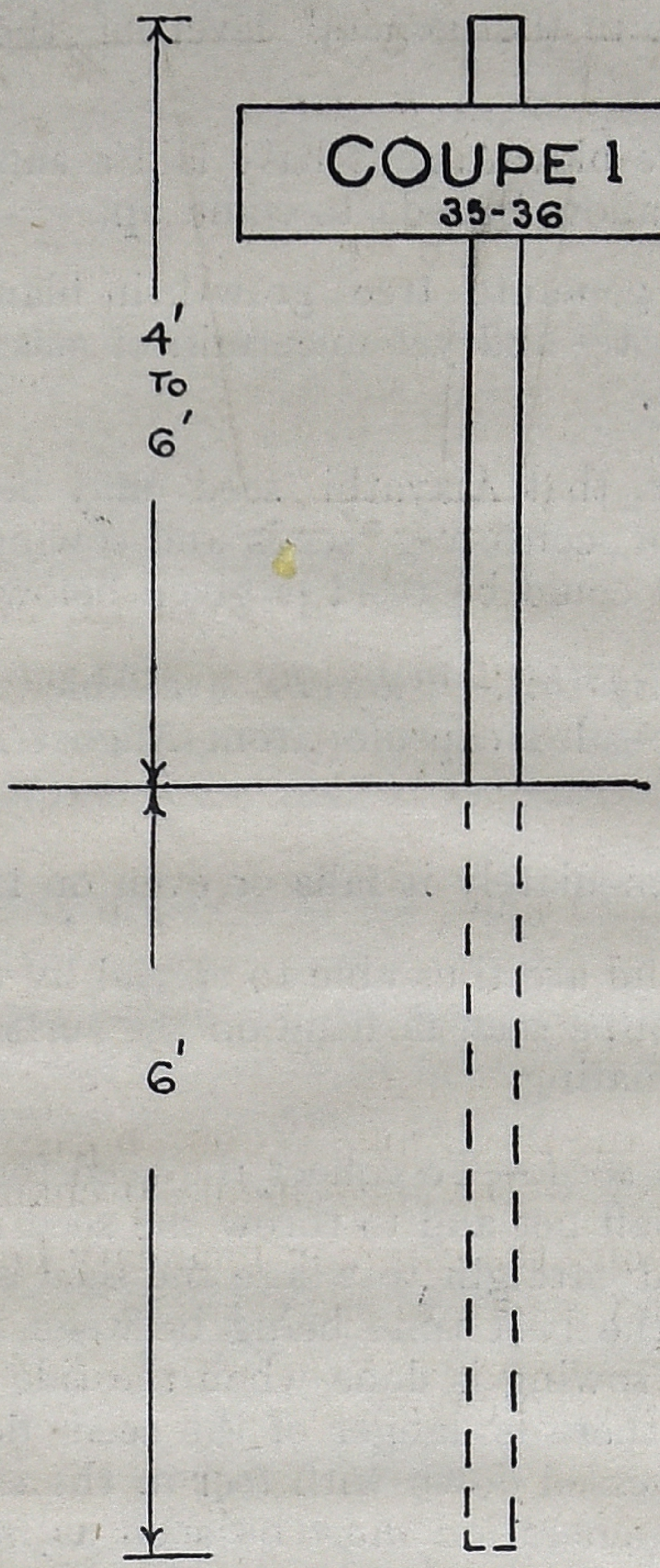
(ii) On the western side of the existing Avicennia growth to a width of a quarter chain in coupes I, II, III, IV and VII.

OTHER REGULATIONS.

95. *Demarcation of worked coupes.*—There is no stone quarry within a reasonable distance from the mangroves. So the cost of even ordinary size (4½ feet × 1¼ feet × ½ foot) coupe stone will come to from Rs. 4 to Rs. 4–8–0 per stone. Proper size of stones for this locality will be 6 feet to 10 feet long according to the depth of slush and these will cost Rs. 8 to Rs. 10 each including cost of transport and planting. Besides, these stones, on account of the slushy nature of the ground, are useless as they are apt to fall down and get buried in the slush, at least in Muthupet.

96. It is proposed, therefore, that the demarcation of felled coupes will be by means of teak boards 13 inches × 8 inches × ¾ inch, nailed to living trees, at the four corners of the coupe. Where living trees are not available, posts 10 to 12 feet in length (buried 6 feet in

the ground) will be used. The boards will have the number of the coupe and the year of felling *engraved* on them as shown in the sketch.



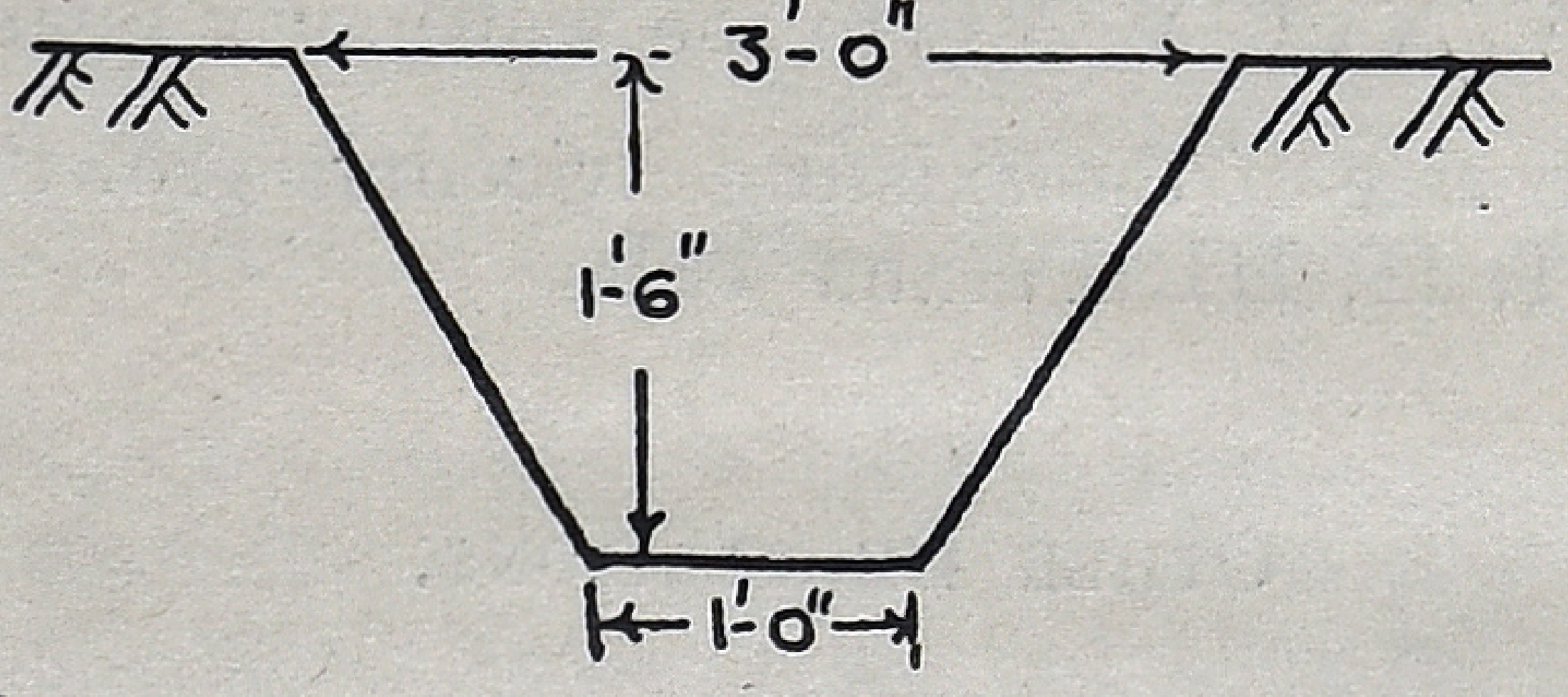
97. The boards will be painted red (for coupes up to 5 years old) and the letters will be in white-lead and thus will serve the double purpose of indicating the area closed to grazing as well as the number and year of felling.

98. After five years when a coupe is opened to grazing the red paint will be converted into black, but the letters will continue to be in white-lead.

99. *Demarcation of outer boundary.*—In the case of Talanayar the outer boundary is demarcated by earthen cairns with a post in the centre. In addition the boundary is defined by theodolite stones or canal bank. Further demarcation by stone slabs is therefore unnecessary.

100. In the case of Muthupet the outer boundary will be demarcated with wooden posts due to the absence of a quarry within reasonable distance and also due to the very slushy nature of the soil. These posts will be inspected in April every year by the Tahsildar and report submitted by him on their condition.

101. *Experimental digging up of channels.*—It is suggested that shallow drains 3 feet at the top, 1 foot at the bottom and 1½ feet deep

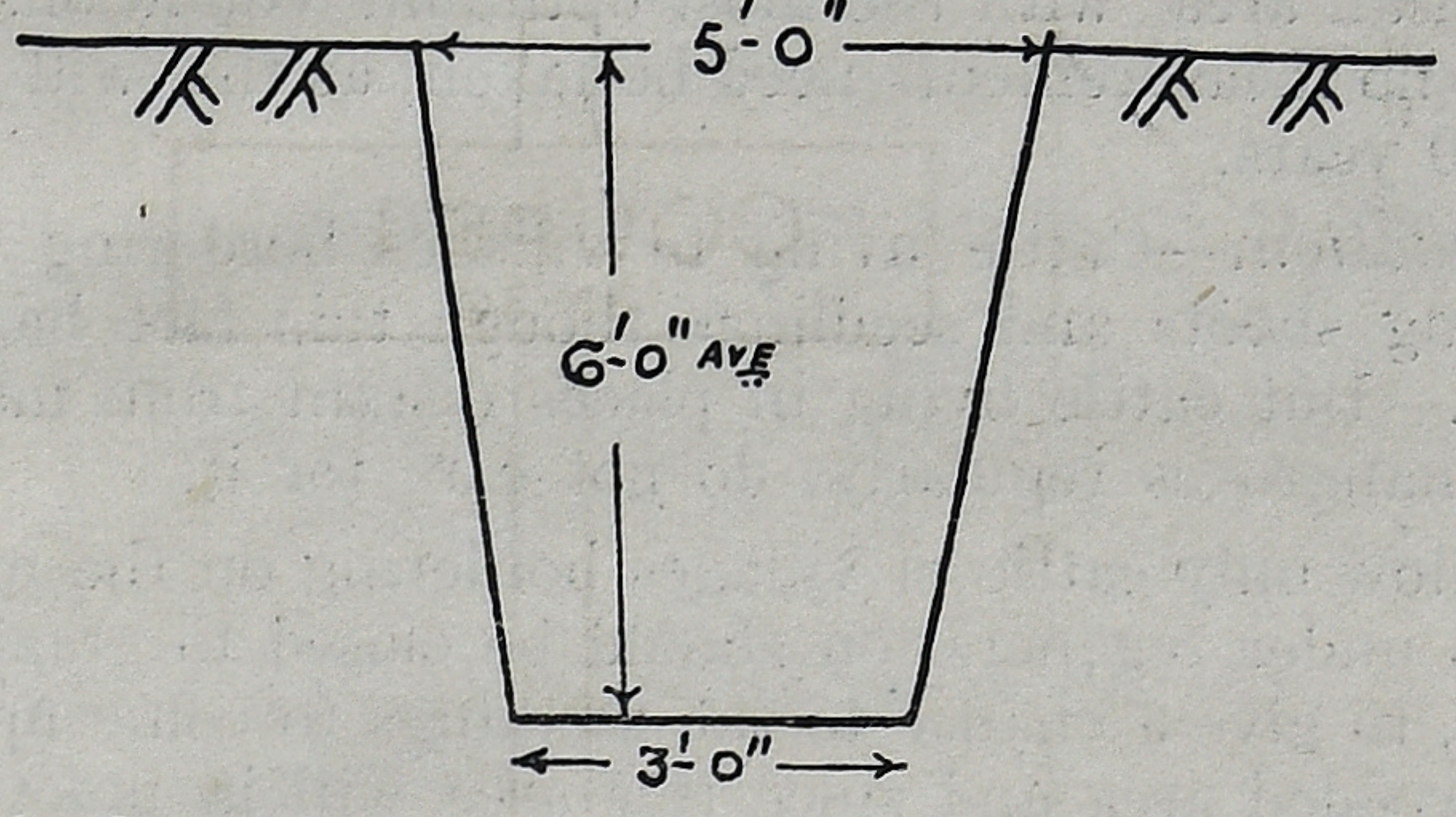


from the lagoons or the sea to about ½ chain beyond the existing growth of Avicennia might be constructed experimentally to see if the Avicennia growth can be prevented from dying as it is doing in some localities in Muthupet, e.g., coupes I, II, XI, XII, XIII and XIV of the Revised Plan.

102. The cost of such drains is expected to be about Rs. 70 per mile, i.e., 16 units of earthwork at Rs. 4–6–0 per unit inclusive of sectioning.

103. Another work that may prove useful for inspection purpose and transport of produce and may at the same time cut down considerably the distances, by providing alternative shorter routes, is the digging up of narrow but deep channels 5 feet on the top, 3 feet at

bottom and 6 feet on average deep connecting the lagoons with the sea or river. Such channels are expected to cost between Rs. 550 and Rs. 600 per mile as per details below :—



$$\frac{5 \text{ plus } 3}{2} \times 6' \times 5280' = 126{,}720 \text{ or } 127 \text{ units.}$$

At Rs. 4–6–0 per unit including sectioning = Rs. 560 per mile.

It is hoped that in course of time these channels will automatically widen out and provide a passage to boats even bigger in size than those employed for inspections and for transporting fuel.

A list of such channels is given below :—

Muthupet—(i) Common boundary between the Chatram and Government Forests :—

(*a*) Between the river Koriar and Cheduguda, i.e., from cairns 43 to 45. Distance about half a mile.

(*b*) Between Cheduguda and the Public Works Department bund near cairn No. 1, i.e., cairn 46 to point E. Distance about 30 chains.

Remarks.—As a channel along the common boundary between the Chatram and the Government Forests will be equally useful to the Chatram as well as to the Forest department, it is possible that the former may consent to a moiety of charge for the construction and maintenance of these two (*a* and *b*) channels.

(ii) Ramaswami Voikal to Siruvoikal (in coupe I of the revised plan) slope to be given from the sea (Palk Strait) to the lagoon via Siruvoikal. Distance about 1½ miles.

Remarks.—This channel when constructed will greatly reduce the distance to Ramaswami Voikal by obviating the necessity of going round the Togaivoikal and the sea. The distance will be reduced from about 7 to 3½ miles.

The total distance of such channels will be roughly 2½ miles and cost about Rs. 1,500 at most. If our object is realized, we might do more of this work in future as funds become available.

104. *Observation Plots*—(*a*) *Virgin Avicennia Sample Plot* (*area* 9·60 *acres*).—This plot has been laid out under orders of the Conservator with the idea of permanent preservation in accordance with the recommendation of the Third Silvicultural Conference (1929) in its resolution No. 22, item (3).

It is situated in Coupe V of the Revised Working Plan and is near the mouth of the Koriar where it empties itself in the lagoon.

The north and south sides of the plot are small creeks and the west side the river Koriar and the east side is a cut line 6 feet wide and 16 chains in length.

It is a virgin Avicennia area densely grown. The maximum height of the Avicennia tree measured on this plot in September 1934 was 45 feet and the maximum girth 36 inches but these height and girth measurements belonged to 2 different trees.

The quantity of fuel removed from the cut line which was 6 feet broad and 16 chains long was 17½ cubic yards or 12½ cubic yards per acre.

105. The cut line must always be kept clear by the subordinates free of charge.

A board has been put up towards the Koriar to indicate this virgin area and it shall be permanently maintained.

106. (*b*) This is a sample plot (4½ chains × 2 chains) in Coupe IX of the Revised Working Plan near Togaivoikal in the recent accretion.

There were in September 1934 only 72 seedlings with heights from 9½ inches to 3 feet 11 inches.

Below 1 foot in height	7
Up to 2 feet in height	56
Up to 3 feet in height	7
Above 3 feet in height	2
	72

Most of the seedlings are probably this year's and some of the last year.

107. This plot has been demarcated on the ground by cut lines and indicated by a board. The object of opening the plot is to see the rate of growth of Avicennia and the time it takes to reclaim an area with the most optimum conditions of growth. The plot will be maintained but no measurements need be taken, as this will be done when Working Plan is revised after 10 years.

108. *Grazing regulation.*—Cattle living in villages bordering on mangroves eat Alayathi (Avicennia) young shoots and seedlings though this fact has been denied by some Revenue Officers here. But cattle living in places distant from mangroves which are not accustomed to go to mangroves regularly, do not care for it.

109. But as we allow only cattle of villages bordering on the mangroves it is desirable that the young coupes under regeneration should be closed to grazing for 5 years, excluding the year of felling, to give a chance to the seedlings to come up. This closure need be confined only to the wooded area and since this area will in practice be only a few acres per annum (i.e.) about 20 acres on average in Talanayar and 50 acres in Muthupet, the closure should not cause any hardship to the villagers. It is realized that fencing mangrove coupes is not possible, yet the provision of closure is made in spite of it.

110. It is generally seen that the advance growth in mangrove coupes shoots up after coupe fellings and the subsequent growth is rapid. Closure of 5 years, exclusive of the year of felling is, therefore, considered adequate.

111. *Control.*—With the idea of collecting accurate figures and making them more handy than they are at present, control forms have been prescribed which will ensure that the prescriptions of the Working Plans are adhered to. Contractors will be required to submit monthly accounts to show *actual removals* from the coupe every month. The return should reach the Tahsildar by the 15th of the month following that for which accounts are due. It is emphasized that such returns will not be of any value unless Forest Guards and Forester are compelled to check the outturn of coupes during inspections.

It is prescribed therefore that the following records will be maintained :—

(1) The Control Book.
(2) The Record of works.
(3) The Control Journal.
(4) The Control Map.

Note.—For forms please see Appendix II.

112. *The Control Map.*—The control map will be maintained on a scale of 4 inches = 1 mile. The map will show separately the wooded and blank areas of coupes (as ascertained by actual survey) and area leased and actually felled and the year of felling. If any portion of a coupe remains unworked within the year, such arrear area should be surveyed and its area and location marked on the map. Any other details regarding the actual courses of small creeks, etc., that might have been omitted in the Working Plan map but become available according to the actual survey of the coupe, shall also be noted.

CHAPTER III.—WORKING PLAN FOR THE SIMPLE COPPICE WORKING CIRCLE OF KODIAKADU.

GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

113. The Working Circle will include Kodiakadu Reserved Forest excluding an area of 1,468 acres in the east and south which contains large blanks dotted with patches of inferior type of forest and about 450 acres on the west and north, which is being left out as a permanent belt to protect against the ravages of shifting sand the Vedaranyam Government Salt Factory and private cultivation of the surrounding villages.

114. An area of about 60 acres has been set apart for acquisition by the South Indian Railway as per the Chief Engineer's letter No. A.P.I.C., dated 15th August 1934, for extension of Tiruturaipundi-Agastiampally line to Point Calimere.

115. The remaining area of 1,977 acres of which the wooded area is estimated at 1,262 acres, has been divided into thirty coupes and shall be worked as a single felling series.

116. *Character of the vegetation.*—The forest included in the Working Circle is of dry evergreen type and a general description of it together with a list of the species found in it has been given in Part I, Chapter II and Appendix I.

117. Some species are locally utilized as small timber (e.g.), *Mimusops hexandra* and *Dichrostachys cinerea* for posts, *Maba buxifolia* and *Hemicyclea sepiaria* for rafters and reepers, *Memecylon* and *Webera corymbosa* for reepers and *Cratæva religiosa* for making wooden sandals and planks for stools.

METHOD OF TREATMENT.

118. The method of treatment proposed is simple coppice with reservation of healthy trees bearing minor forest produce such as tamarind, soapnut, cassia, fistula, etc.

Note.—For this purpose Palai (Mimusops) will not be considered a tree yielding minor forest produce.

In a belt of 5½ feet all round the coupe, no growth will be cut as this is to form a live fence—vide paragraphs 134 (*b*) and 140.

119. *Rotation.*—Rotation will be 30 years, and size of coupes on average 42 acres. For want of data for scientific calculation, it has been fixed on general grounds and mainly with the idea of producing billets of the sizes mostly in demand for fuel for local consumption. This rotation is also expected to produce some small timber.

For tabular statement of felling please see paragraph 143.

120. The yield will be regulated by area.

METHOD OF EXECUTING THE FELLINGS.

121. One coupe will be felled every year, through the agency of a contractor.

122. Coupes shall be sold in public auction every year at so much per acre and not by lump sum amount.

123. The lease will run from 1st April to 31st March of the next year.

124. The sales should be advertised in the December issue of the District Gazette and held not later than the beginning of February each year.

125. Coupes remaining unsold in the original sale but sold subsequently will be leased only for the period ending with 31st March.

126. The coupe to be felled will be surveyed and demarcated on the ground by a cut line 10 feet wide, with reference to the Working Plan map, in the month of November of the year previous to the felling. A plan of each coupe on a scale of 8″ = 1 mile with strips and their areas marked should be ready before the date of sale with details showing the bearing and distances of the boundary lines in red and black ink respectively. A copy of the plan should be attached to the agreement.

127. Area arrived at by actual survey will be adopted for the lease. Differences between the nominal areas shown in the Working Plan and the areas computed by actual survey will not constitute a deviation requiring special sanction unless there is change in the boundaries as well.

128. If a coupe is more than 20 acres in extent, it should be divided by cut lines into a convenient number of strips of approximately equal size (generally of not more than 20 acres each). But if a coupe is naturally subdivided by creeks or blanks, lines need not be cut though areas of strips may differ.

129. Fellings should proceed systematically from one end of the coupe and working in patches here and there should never be allowed.

130. Fellings should be completed in one strip before the next is taken up. The order in which strips should be taken up for fellings is left to the discretion of the Revenue Divisional Officer, but should be marked on the sketch attached to the agreement.

131. Portions left unfelled at the close of the lease will be surveyed and the area computed and sold, of choice, to the current year's contractor. In which case he should be made to first fell the arrear area before the current year's coupe is taken up. The rate to be fixed by the Revenue Divisional Officer to be either the rate realized for the coupe originally or the rate at which current year's coupe is sold.

132. The work of coolies should be supervised either by the contractor or by an authorized agent of his.

133. Firewood shall be heaped in stacks of uniform dimensions before it is allowed to be removed (the usual local size of a stack is 6′ × 3′ × 3′).

Felling Rules.

134. No growth described below shall be felled—

(*a*) Healthy minor forest produce yielding trees such as tamarind, soapnut, cassia fistula, etc.

(*Note.*—Palai or Mimusops tree will not come under this category.)

(*b*) Trees or other growth to a width of 5½ feet on the periphery and within the demarcated and cleared lines of a coupe. The belt is intended to serve as a live fence.

(*c*) All avaram (cassia auriculata) bushes.

135. All tree growth except that mentioned above, shall be clear felled at a height not exceeding about 6 inches from the ground.

136. All climbers shall be cut close to the ground.

137. Trimming of stools is unnecessary. But care should be taken that the bark of stumps is neither damaged nor separated from the wood.

138. Under no circumstances shall a stool be trimmed after a tree has been felled.

139. Under no circumstances shall the removal of leaf mould or of fallen leaves whether dead or green be made from the leased coupe.

(*Note*.—**This practice exists at present and must be put down.**)

140. As the fellings proceed, the contractor will build up a strong fence 4 feet high and 5½ feet broad round the periphery of the coupe by packing thorns and brushwood in the interspaces of the live hedge.

141. After constructing the fence any surplus material in the shape of thorns, etc., lying in the coupe may be sold by the contractor on head-load chits to the neighbouring villagers.

142. No timber (i.e., posts or rafters) shall be removed from the coupe before it is hammer-marked by the section forester or the beat forest guard whosoever is authorized by the Revenue Divisional Officer to do so.

TABULAR STATEMENT OF FELLINGS.

143. The sequence of fellings is given in the following statement :—

Sequence of coupes to be worked in the Simple Coppice Working Circle of Kodiakadu.

Year.	Coupe.	Area in acres (wooded only).	Year.	Coupe.	Area in acres (wooded only).
1935–36	I	43·0	1950–51	XVI	41·0
1936–37	II	40·0	1951–52	XVII	38·0
1937–38	III	46·0	1952–53	XVIII	49·0
1938–39	IV	42·0	1953–54	XIX	48·0
1939–40	V	45·0	1954–55	XX	45·0
1940–41	VI	38·0	1955–56	XXI	44·0
1941–42	VII	47·0	1956–57	XXII	41·0
1942–43	VIII	37·0	1957–58	XXIII	48·0
1943–44	IX	40·0	1958–59	XXIV	36·0
1944–45	X	38·0	1959–60	XXV	40·0
1945–46	XI	35·0	1960–61	XXVI	47·0
1946–47	XII	48·0	1961–62	XXVII	38·0
1947–48	XIII	44·0	1962–63	XXVIII	41·0
1948–49	XIV	47·0	1963–64	XXIX	36·0
1949–50	XV	44·0	1964–65	XXX	36·0
				Total ..	1,262·0

Note.—Sequence of coupes has been fixed according to the maturity of the growth. Coupes are, therefore, not necessarily contiguous.

SUBSIDIARY SILVICULTURAL REGULATIONS.

144. *Climber cutting.*—When minor forest produce producing trees are being marked for retention, they shall be thoroughly freed from climbers. Climbers will be cut at two places, at about 2 feet and again at about 4 feet from the ground, the middle portion of about 2 feet thus obtained will be thrown away. The stump of the climber shall be hacked to prevent its sending up shoots.

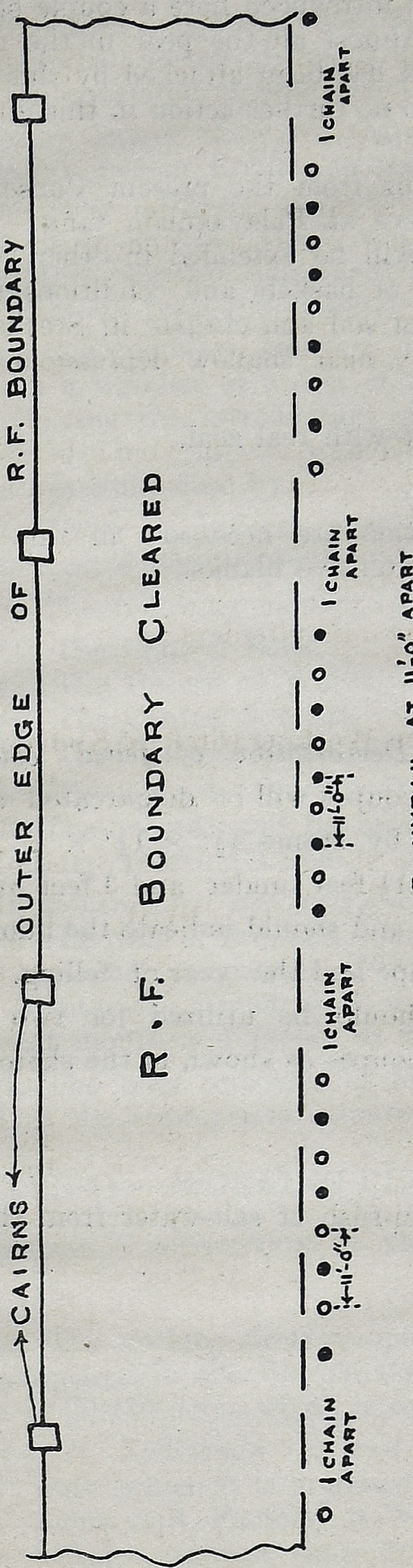
145. Each coupe will be adequately fenced by the contractor before it is handed back to the Department. (See felling rules.)

146. During the period of closure (i.e., for five years excluding the year of felling) the subordinates, in addition to keeping the fence in repair, shall be given one definite coupe every month in rotation, in which to cut climbers. In this way each coupe will be gone over at least twice in a year and not less than ten times during the period of the total closure.

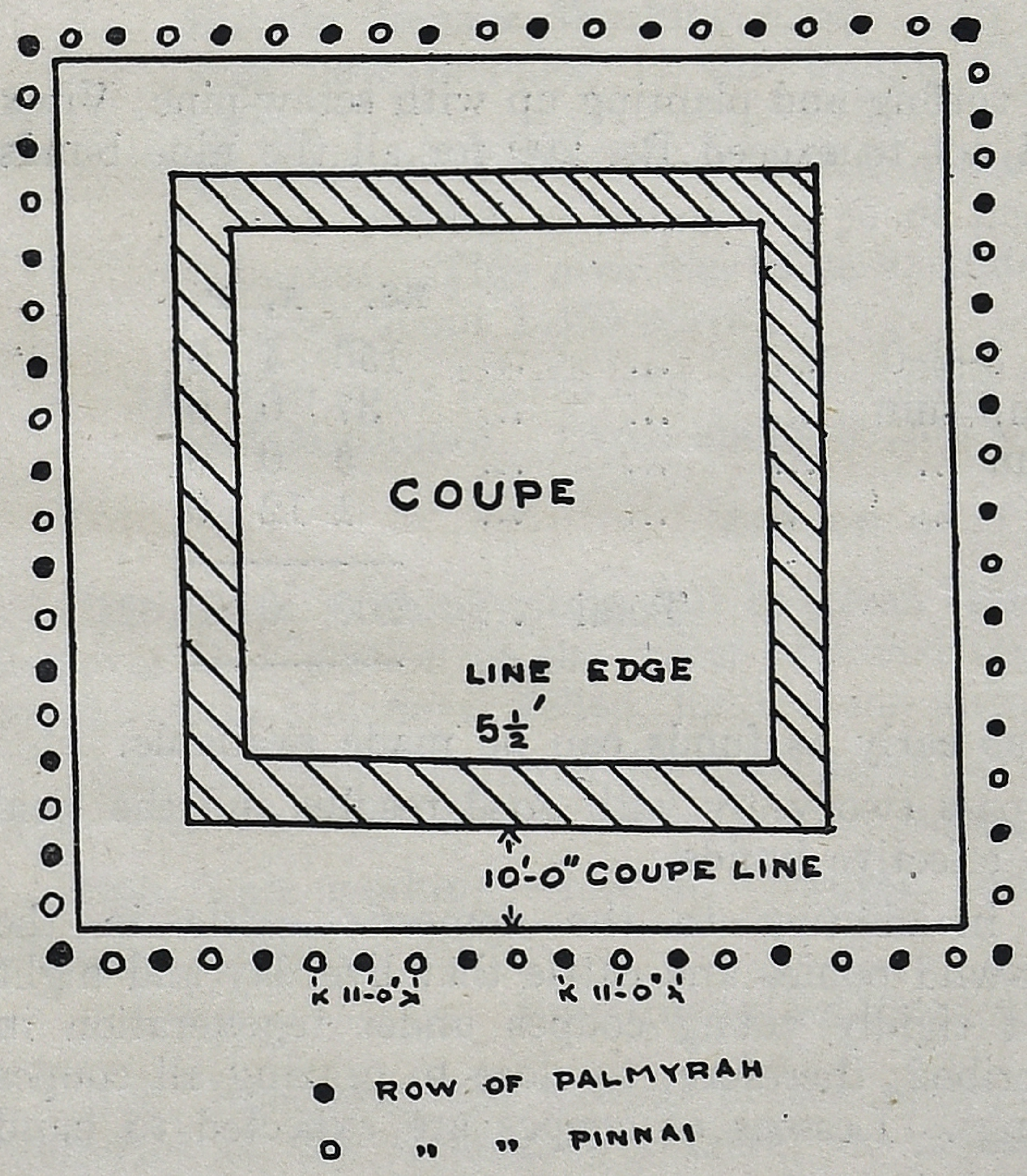
147. No rab sowings have been prescribed as due to the porous and sandy nature of the soil devoid of any humus, the locality is totally unsuited for rab sowings.

Further the Revenue Divisional Officer and the Tahsildar can hardly find time enough to devote personal attention to make these operations successful.

148. Palmyra seeds, however, shall be sown by the subordinates along the coupe lines and all along the outer boundary of the reserve 11 feet apart. The seed sells at As. 4–0 per 100 at Agastiyampalli and locally and purchase of seeds will be the only cost that will be incurred.


CAIRNS
OUTER EDGE OF R.F. BOUNDARY
R.F. BOUNDARY CLEARED
1 CHAIN APART
1 CHAIN APART
1 CHAIN APART
1 CHAIN APART
11'-0"
11'-0"
● ROW OF PALMYRAH AT 11'-0" APART
○ " " PINNAI

In the case of the Reserve boundary, the seeds will be sown along the inner edge of the boundary (as shown in the sketch given in the margin) so that the demarcation stones at cairn points are not hidden. It is necessary for boundary verification and other purposes that the survey stones be clearly visible from one another. It is often necessary also either to start from or to end a survey at one of these demarcation stones. For this reason it is advisable that no palmyra seed be sown for one chain on either side of a survey stone. In other words, there will be a break in the palmyra sowing for two chains opposite survey stone near cairns. " Pinnai " Calophyllum inophyllum seeds (which can be collected locally from surrounding villages in any quantity free by the subordinates) should be sown between palmyras. This species is selected as it grows easily in this locality and forms a good hedge plant. Its seeds are used for extracting oil and wood is also in demand locally. The plant flowers and fruits at least twice a year.


COUPE
LINE EDGE
5½'
10'-0" COUPE LINE
11'-0"
11'-0"
● ROW OF PALMYRAH
○ " " PINNAI

149. In the case of coupe lines, the sowing will be done along the outer edge (please see marginal sketch) ; the idea being to demarcate permanently the boundaries of each coupe for the future. No palmyra seed will be sown along any side of a felled coupe which adjoins an old coupe line, on which palmyra sowings have already been done, unless gaps are to be filled up in the old line.

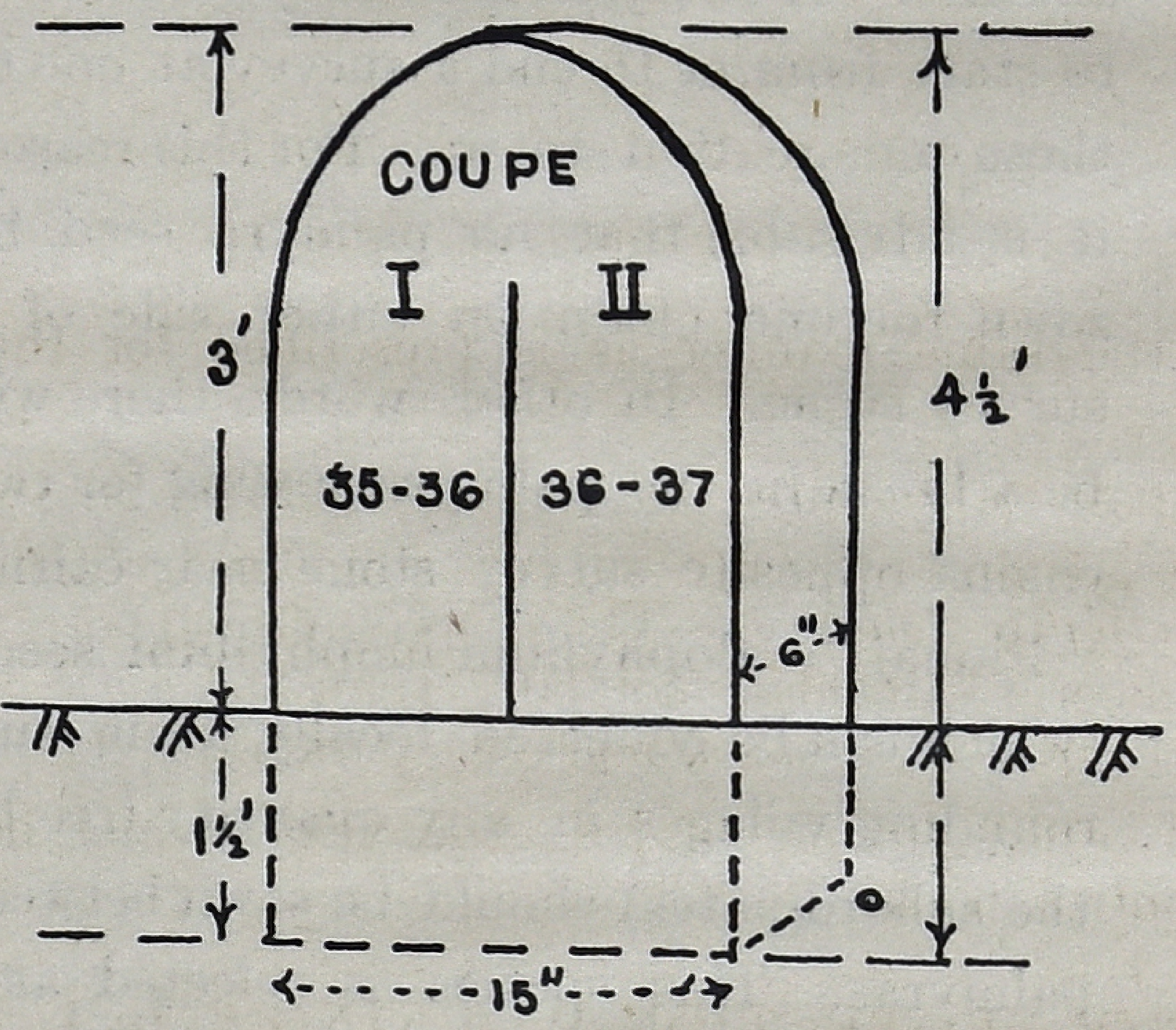
150. Cochineal insect (Dactylopius tomentosus) was introduced here a couple of years back to kill the pricklypear plant (Opuntia dillenii). Almost all the pear in the reserve and outside it in Kodiakadu and Point Calimere villages has been attacked by this insect and has either died completely already or is fast dying, so no further action in this direction is necessary.

151. *Cane growing experiment.*—Under instructions from the present Conservator, cane (Calamus Viminalis) is being tried in this Reserve at Palayakulam tank. If the experiment proves successful the propagation of cane will be extended in other suitable localities. Cane is in demand locally for manufacture of baskets and conditions in this Reserve appear suitable, as in more or less same type of soil and climate in Sreeharikota reserve of Nellore district. Cane grows very profusely near shallow depressions where fresh water accumulates.

It is hoped that this experiment will be carried out with real zeal.

OTHER REGULATIONS.

152. *Fire protection.*—No measures of fire-protection are necessary in this sandy area devoid of humus and surrounded by swamps and extensive blanks.



153. *Demarcation of felled coupes.*—Felled coupes will be demarcated at four corners by stones 4½' × 1¼' × ½'. They will be 1½ feet under and 3 feet over the ground and should indicate the number of the coupe and the year of felling. Each stone should be utilized for two contiguous coupes as shown in the sketch.

154. Earthen bunds across creeks to prevent the in-rush of salt-water from the salt swamps will be constructed at the following places :—

Between Cairns—
10 and 11,
12 and 13,
13 and 14,
14 and 15,
20 and 21,
23 and 24,
37 and 38,
39 and 40,
40 and 41.

The total cost of these bunds including turfing and planting up with screw-pine, Vitex negunda, Ipomea biloba, etc., is estimated not to exceed Rs. 200 for all the nine bunds mentioned above, as follows :—

	RS.	A.	P.
Earthwork about 50 units at Rs. 3–2–0	156	4	0
Plants and cost of planting. Lump sum	37	0	0
Crib or modasal work. Lump sum	5	0	0
Contingencies	1	12	0
Total ...	200	0	0

The work should be done in 1936–37, or as early as funds can be made available.

Such work has been already done in past two years with good results and the local staff are by now well versed in putting up effective bunds.

155. *Grazing regulations.*—There are, in addition to the domestic cattle in the surrounding villages, large number of semi-wild ponies and cattle that live day and night in the reserve. It is necessary to protect rigidly young coupes under regeneration in this arid, dry and sandy tract. It is prescribed, therefore, to close to grazing all coupes for five years (excluding the year of felling). Lessees of coupes are expected to hand

over all coupes adequately fenced, after the expiry of lease period (see Felling Rules). This fence shall be kept in repair for five years or for such period as the Revenue Divisional Officer, in consultation with the Conservator, orders.

Closure longer than six years (including the year of felling) is not recommended for felled coupes in Kodiakadu reserve because of the existence of semi-wild cattle and the consequent difficulty of protecting the coupes effectively for such a prolonged period without excessive cost which will be out of all proportions to the advantages gained. Further it is believed that there will be no real danger to the coppice in opening the coupes after six years protection.

156. *Subordinates' quarters at Kodiakadu.*—Quarters for one forester, one forest guard and a watcher at a cost of Rs. 2,750 will be constructed during the course of five years following the introduction of the revised working plan. A site has been selected and approved by Collector and Conservator. It is in Government unreserve and fresh water is available close by.

157. There is no fresh water well in the Kodiakadu rest-house. If a fresh water spring is located within convenient distance a well may be constructed.

158. The following control records will be maintained :—

(1) The Control Book.
(2) The Record of Works.
(3) The Control Journal.
(4) The Control Map.

(*Note.*—For forms see Appendix II.)

159. The records will be maintained in the same manner as is prescribed for the Clear Felling Working Circle.

160. *Contractors' accounts.*—Contractor shall be required to furnish monthly statements of removals of firewood, and timber, etc., from the coupes. The statement should show the number or quantity of the produce *actually removed.* These accounts supported by the counterfoils should reach the Range Officer (Tahsildar) not later than the 15th of subsequent month and *should be verified as regards their accuracy*—see paragraph 111.

161. The total removals of firewood and other produce during the year should be entered in the appropriate columns in the control book.

CHAPTER IV.—WORKING PLAN FOR THE PROTECTION WORKING CIRCLE.

General Constitution of the Working Circle and the Character of the Vegetation.

162. The working circle comprises the balance of the three reserves after excluding the areas comprised in the Simple Coppice and the Clear Felling Working Circles. It has an area of 20,180 acres which is composed of—

(*A*) *In Kodiakadu reserved forest.*—(i) A belt of forest towards the north and west, which it is proposed to leave uncut hereafter, for the protection of Government Salt Factory at Vedaranniyam and the cultivation in the surrounding villages, against sand drifts. The forest is as good as that included in the Simple Coppice Working Circle. In fact in portions it is better than the best area now included in the Simple Coppice Working Circle. (Area about 450 acres.)

(ii) Portion of the forest in the south and west, containing large blanks dotted with patches of inferior type of growth, consisting chiefly of stunted thorny bushes. This area has to be excluded as it is unfit for exploitation at present. (Area about 1,468 acres.)

(*B*) The large blanks and water-courses in the remaining two reserves of Talanayar and Muthupet. (Area about 18,202 acres.)

Method of Treatment.

163. This working circle will be given rest from any kind of fellings. It is intended however that portion of the forest included under (*A*) (i) should be henceforth *preserved permanently* and never felled, for reasons already given.

164. Materials required for departmental work and free grants may however be cut from this working circle, under proper authority.

165. This working circle is, however, included in the Minor Forest Produce and Grazing Working Circles.

Subsidiary Silvicultural Regulations.

166. Excepting the sowing of the palmyra and Calophyllum seeds along the outer boundary of the Kodiakadu reserve, no subsidiary operations are prescribed. Climbers noticed by the subordinates during their patrolling will be cut as a matter of routine.

OTHER REGULATIONS.

167. *Grazing.*—In Kodiakadu reserved forest there are semi-wild cattle which remain day and night in the reserve and it is impossible to exclude them except from small areas, adequately fenced, e.g., young coupes, while in the case of mangroves of Talanayar and Muthupet it is only the blanks that contain grass for cattle to graze. So grazing will be allowed in the Protective Working Circle.

168. *Control Records.*—No separate control records are prescribed for this working circle as prescriptions of Grazing and Minor Forest Produce Working Circles will apply to this area also. If, however, any material is extracted for departmental works or free grants from Kodiakadu portion of the working circle which alone contains some tree growth, the produce may be shown in control form prescribed for the Simple Coppice Working Circle with a suitable note.

CHAPTER V.—WORKING PLAN FOR THE GRAZING WORKING CIRCLE.

GENERAL CONSTITUTION OF THE CIRCLE.

169. The Grazing Working Circle consists of all the three reserves, namely, Kodiakadu, Talanayar and Muthupet with the exception of certain specified areas which are or may be closed to grazing under proper authority either permanently or temporarily. The total area of this working circle is 23,820 acres. It is proposed that only coupes which are under five years of age should be closed temporarily to grazing in both the Clear Felling and the simple Coppice Working Circles.

170. The total area thus closed temporarily under the working plan prescription is expected to be about 600 acres or roughly one-fifth of the wooded area included in the felling series and roughly about one-fortieth of the gross area.

METHOD OF TREATMENT.

(*i*) *The object of management.*

171. The object is—

(*a*) To provide pasture for the cattle of the villages in the neighbourhood of the three reserves consistent with the preservation and silvicultural requirements of the forests.

(*b*) To produce revenue by issue of licences for cattle allowed to graze.

(*ii*) *Regulation of Grazing.*

172. Grazing will be regulated by issue of permits subject to the usual conditions. Goats will be excluded.

173. The grazing year will be from 1st July to 30th June.

174. Calves up to six months old will be allowed free, while those above that age will be allowed to graze on full rates only. Subject to this condition, the rates already approved by Government for Talanayar, namely, Re. 1 per cow and Rs. 2 per buffalo [G.O. Mis. No. 550, Revenue (Special), dated 26th March 1919] and for Kodiakadu reserved forest a flat rate of Re. 0–8–0 per cow, pony or buffalo (G.O. Mis. No. 855, Development, dated 15th July 1933) will be allowed to stand.

175. For Muthupet block which has till now remained closed (theoretically only) a rate of Re. 0–8–0 per cow unit is recommended and will be charged after obtaining the sanction of Government (already applied for). Permits will however not be issued till the area has been notified under section 16.

(*iii*) *Grazing Blocks.*

176. All the three reserves will constitute one grazing Working Circle. But as prescribed by G.O. Mis. No. 802, dated 11th June 1932, grazing in all the three reserves will be allowed only for those cattle for which permits at the highest sanctioned rate in the district have been purchased. The highest rate being Re. 1 per cow for Talanayar reserved forest.

177. *Penning.*—The practice of penning cattle is not in vogue here.

178. In Kodiakadu reserved forest we are faced with the difficulty of realizing full legitimate grazing revenue from villages bordering on the reserved forest.

179. When Government fixed the flat rate of Re. 0–8–0 per cow, pony or buffalo in their Order Mis. No. 855, Development, dated 15th July 1933, they relied on " fair play " by the villagers, to buy permits for all of their cattle, tame and semi-wild.

[The semi wild cattle are claimed by villagers and the ownership is indicated by branded marks.]

180. The latest cattle census taken with the help of Revenue Officials indicates that villages purchase permits only for about 25 per cent of tame and semi-wild cattle owned by them. In order to safeguard the interests of the Forest Department, proposals with which the Collector has concurred, have been submitted to the Chief Conservator to obtain sanction of Government for Kodiakadu a system similar to one sanctioned by them

in their Order Mis. No. 269, Development, dated 12th February 1924, for the Sriharikota Reserve of Nellore district and which permits the Forest Department to levy grazing fee from villagers in a lump sum based on the cattle census. This is necessary as subordinates are few and unable to capture and impound the shy semi-wild cattle.

SUBSIDIARY MEASURES OF IMPROVEMENT.

181. Nil.

OTHER REGULATIONS.

182. *Grazing.*—Coupes felled under Clear Felling and Simple Coppice systems will be closed to grazing for 5 years excluding the year of felling. Coupes felled under Simple Coppice will be adequately fenced and the fence kept up for 5 years or for such period as the Conservator directs.

183. Mangrove coupes felled under Clear-felling system need not be fenced.

184. *Control.*—A control book for the Grazing Working Circle shall be maintained. The form to be used is given in Appendix II.

CHAPTER VI.—WORKING PLAN FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

GENERAL CONSTITUTION OF THE WORKING CIRCLE.

185. The Minor Produce Working Circle comprises all the three Reserves of the division. The area of the Working Circle therefore is 23,820 acres. Each Reserve will, however, form a separate unit for the purpose of exploitation.

186. Cassia auriculata (Avaram) will not be leased and manure leaves will not be allowed to be removed. (Please see paragraph 18, page 4, C.C.P. No. 145, Press, dated 9th March 1931 and C.C.P. Rt. No. 428/33, dated 28th June 1933.)

METHOD OF TREATMENT.

187. Minor forest produce shall be exploited through the agency of contractors.

188. As at present, Umri and Nandi (Suaeda species) will be leased as a separate item.

189. Other saleable items will be sold separately or together according to the discretion of the Revenue Divisional Officer.

190. All leases will run from 1st April or any subsequent date of sale or acceptance of tender, to the 31st March of the following year.

SUBSIDIARY MEASURES OF IMPROVEMENT.

191. Nil.

OTHER REGULATIONS.

192. *General.*—At present there is no reliable information as to the quantities removed. This information is necessary for all items except fishing and more especially for Umri (Suaeda). In future contractor will be required to submit monthly accounts by the 15th of the month following that to which the accounts relate.

A Control Book shall be maintained in the form given in Appendix II.

CHAPTER VII.—ESTABLISHMENT AND LABOUR.

193. *Establishment—Administrative staff.*—The Revenue Divisional Officer, Mannargudi will, as at present continue to be the ex-officio District Forest Officer.

Executive Establishment.—The Tahsildar of Tiruturaipundi is the ex-officio Range Officer. No change is proposed in this arrangement on grounds of economy. For though it would be an advantage if a Ranger were put in charge, yet the area is so small that the cost of a Ranger and his clerk and peon would be proportionately high.

Protective staff.—This consists of 1 Forester, 4 Forest Guards, 3 Watchers. Of these 2 Forest Guards, 1 Reserve Watcher and 1 Bungalow Watcher (for Point Calimere Rest House) are in Kodiakadu.

NOTE.—The Bungalow Watcher is generally given some Forest work when no officer is camping in the rest house.

There is only 1 Forest Guard at Talanayar.

The remaining Forest Guard and a Watcher are for Muthupet.

Forester exercises a general supervision over the 3 Reserves and their respective establishment.

194. The only change proposed is to reduce the number of Forest Guards for Kodiakadu from 2 to 1 and instead increase the number of Watchers by one and allot this post to Talanayar Reserve where at present there is no help for the Forest Guard. Thus total strength will be one Forester, 3 Forest Guards and 3 Watchers (1 Forest Guard and 1 Watcher for each reserve) and 1 Bungalow Watcher who will when not occupied with works at the Bungalow help the Forest Guard of Kodiakadu Reserved Forest.

195. *Labour.*—Sufficient labour is available in the surrounding villages to carry out the works prescribed by this plan in all the three reserves.

CHAPTER VIII.—FINANCIAL FORECAST, COST OF THE PLAN AND SUMMARY OF PRESCRIPTIONS.

196. *Financial forecast for the ten-year period from* 1935–36 *to* 1944–45—

Revenue.

Serial number and particulars. (1)	Rate per annum. (2)	Reference to paragraph. (3)	Amount expected to be realized in ten years. (4)	Remarks. (5)
	RS.		RS.	
1 By sale of fuel coupes ..	(*a*) 10 per acre.	65 and 143	12,330	..
416 acres (Kodiakadu). 155 ,, (Talanayar). 662 ,, (Muthupet). 1,233 acres.				
2 By sale of grazing permits ..	(*b*) 1,000	172	10,000	..
3 Nandi Umri	(*c*) 500	..	5,000	..
4 Other items of produce ..	(*d*) 200	..	2,000	..
5 Timber, fuel, minor produce from unreserves.	(*e*) 6,000	..	60,000	..
6 Miscellaneous other sources ..	(*f*) 3,000	..	30,000	..
			1,19,330	

Expenditure.

Serial number and particulars. (6)	Rate on average. (7)	Reference to paragraph. (8)	Amount expected to be spent. (9)	Remarks. (10)
			RS.	
1 Survey and demarcation of 30 coupes that is to say cost of coupe stones for Kodiakadu and posts and boards for Talanayar and Muthupet.	Rs. 8, per coupe.	72 and 96 126 and 153	240	For Kodiakadu Reserve forest 12 per coupe and for the remainig 2 at Rs. 6 per coupe.
2 Dibbling Palmyra nuts round coupes in and the periphery of Kodiakadu Reserved Forest 50 miles.	Rs. 3. per mile.	148 and 149	150	
3 Earthen bunds in Kodiakadu Reserved Forest to prevent inrush of salt water.	..	154	200	
4 Experimental sowings of Alayathi (Avicennia) seeds in Talanayar aud Muthupet forests.	..	89, 93 and 94	100	
5 Experimental digging of shallow channels to prevent the dying of Alayathi for lack of salt water and for encouraging growth of the species in Talanayar and Muthupet.	..	101 and 102	200	Detailed information as to the work and cost have been given in paragraphs 101 to 103.
6 Digging of deep channels 2½ miles to facilitate inspection, transport and to encourage Alayathi growth in Muthupet Reserved Forest.	..	103	1,500	
7 Permanent demarcation of Muthupet Reserved Forest by Avicennia posts mud and cairns.	..	100	50	
8 Repairs to boats (four boats of which one will have to be sold shortly).	..	..	200	
9 Repairs to buildings, i.e., Kodiakadu rest house and subordinates quarters and wells attached.	..	..	1,000	
10 Construction of quarters for subordinates at Kodiakadu.	..	156	2,750	
11 Construction of a well at Kodiakadu rest house.	..	157	100	
12 Interest at 5 per cent on capital outlay for five years on half the period of the plan as the works will be constructed progressively. (*a*) Digging channels .. .. .. Rs. 1,500 (*b*) Permanent demarcation of Muthupet Reserved Forest. 50 (*c*) Quarters for subordinates and well at Kodiakadu. 2,850 4,400	..	..	220	
13 Protective staff— Permanent— One forester average .. .. Rs. 35 Three forest guards .. .. 51 86 × 12 = 1032	..	194	10,320	
14 Temporary— Three watchers at Rs. 10 .. .. 30 One bungalow watcher at Rs. 10 .. 10 40 × 12—480	..	194	4,800	
15 Allowances— Fixed Travelling Allowance to Forester. ..	..	..	1,000	
16 Contingencies	..	..	1,000	
			23,830	
Anticipated surplus of revenue over expenditure during the 10 year period			95,500	
Annual anticipated profit			9,550	

Note.—(*a*) The average rate over the last 10 years comes to Rs. 12 per acre ; but a rate of Rs. 10 has been adopted to be on the safe side.

(*b*) The average for the last three years for Kodiakadu and Talanayar Reserved Forests comes to Rs. 850 but Rs 1,000 has been adopted as it is proposed to open Muthupet block to grazing and also an increase is expected in Kodiakadu Reserved forest. More than three years' average has not been adopted as Kodiakadu Reserved Forest was previously closed to grazing.

(*c*) and (*d*) Based on the average of the past three years, as reliable separate figures are not available for the period 1923 to 1932 in respect of Muthupet which was under the management of the Chatram department of the District Board.

(*e*) Based on the average of the last five years.

(*f*) The five years' average works out to Rs. 5,800. This includes some abnormal years. So an average of Rs. 3,000 has been adopted.

197. *Cost of the working plan—*

Particulars.				Amount.			
	RS.	A.	P.	RS.	A.	P.	
Pay of officers (Voted)				7,515	15	0	
Pay of establishment				677	10	0	
Other charges—							
Travelling allowance—Voted—							
Working Plan Officer	816	1	0				
Subordinates	138	3	0				
				954	4	0	
Fixed Travelling allowance and other Compensatory allowance				87	6	0	
Contingencies				152	15	0	
Total ..				9,388	2	0	
Deduct—Cost of the Extra Assistant Conservator and his establishment for the total period of three months spent on other work such as survey and preparation of section 4 notification and map for Muthupet, rectification of the Kodiakadu boundary as per section 16, notification and preparation of notification and maps for three extensions to the Kodiakadu Reserve Forest marking and thinning in Coimbatore South, verification of old Board's Proceedings and Government Orders				2,964	0	0	
Balance cost on 23,820 acres				6,424	2	0	
Therefore cost on 1 acre				6,424	2	0	÷ 23,820
				= 0	4	4	

SUMMARY OF PRESCRIPTIONS

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Analysis of the crop not carried out	60
Valuation of the crop not attempted	61
Silvicultural system will be clear-felling with reservation of 20 to 25 seed bearers	62
Rotation fixed at 20 years on practical consideration	63
Size of the annual coupes will be on average about 16 acres in Talanayar and 68 acres in Muthupet	64
Sequence of felling is given	65
The yield will be regulated by area	66
One coupe in each Felling Series will be felled every year through contractor	67
Coupe will be sold at so much per acre	68
Lease to run from 1st April to 31st March	69
Sales to be advertised in December	70
Coupes not sold at original sale should be leased out for period ending 31st March	71
The coupe to be felled will be surveyed and demarcated by means of cut line 10 feet wide in November of the year previous to felling and 8 inches to the mile plan of the coupe is to be prepared	72
Area arrived at by actual survey is to be adopted	73
When a coupe is more than 20 acres it is to be divided into convenient strips	74
Fellings should proceed systematically	75–76
Portions of coupe left unfelled will be surveyed and sold normally to lessee of the subsequent year's coupe	78
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Demarcation of felled coupes will be by means of boards nailed to trees and painted red	96–97
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Felled coupes will be closed to grazing for 5 years excluding year of felling	109–110
Contractors will be required to furnish monthly accounts and the following records will be maintained:—	
The Control Book.	
The Record of Works.	
The Control Journal.	
The Control Map (4 inches = 1 mile)	111–112

Simple Coppice Working Circle.

The area included in the Working Circle is the Kodiakadu Reserve Forest excluding:	
(i) 450 acres on the north and west proposed to be retained permanently as wind screen.	
(ii) 1,468 acres of inferior forest on the south and west at present not workable.	
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The Felling Series include an area of 1,977 acres of which only 1,262 acres is wooded	115
Character of the vegetation is described	116–117
The Silvicultural method will be Simple Coppice with the reservation of healthy Minor Forest Produce yielding trees ...	118
Rotation will be 30 years and size of coupes on average 42 acres. It has been fixed on practical consideration	119
The yield will be regulated by area	120
One coupe will be felled every year through a contractor ...	121
Coupe shall be sold at so much per acre	122
The lease will run from 1st April to 31st March	123
Sales should be advertised in December	124
Coupes remaining unsold will be sold for the period ending with 31st March	125
Coupes to be felled will be surveyed and demarcated by means of a cut line 10 feet wide in November of the year previous to felling and a map 8 inches to the mile of the coupe should be prepared	126
Area arrived at by actual survey is to be adopted	127
Coupe is to be divided into convenient strips	128
Felling should proceed systematically	129–130
Portions of coupe left uncut will be surveyed and sold normally to the lessee of subsequent year's coupe	131
Coolies' work should be supervised by the contractor or his authorized agent	132
Stacking is prescribed of felled firewood prior to removals ...	133
Felling rules are given in detail	134–142
The sequence of coupes is given	143
Felled coupes will be adequately fenced by contractors before handing them over to the Department	145
Fence will be maintained round and climbers cut in felled coupes by subordinates	146
No rab sowings have been prescribed on account of the unsuitability of the soil and locality	147

	PARAGRAPHS
Palmyra sowings will be done round the reserve and coupe lines at 11 feet apart and Calophyllum inophyllum seeds will be sown between palmyra seeds	148–149
Cochineal insect was introduced couple of years back and has killed almost all the pear	150
Experimental cane growing is suggested	151
No fire tracing operations are necessary	152
Felled coupes will be demarcated by stones $4\frac{1}{2}'$ x $1\frac{1}{4}'$ x $\frac{1}{2}'$	153
Earthen bunds will be constructed to prevent in-rush of salt water	154
Felled coupes will be closed to grazing for five years excluding year of felling	155
Subordinate quarters for one Forester, one Forest Guard and a Watcher at a cost of Rs. 2,750 will be constructed	156
A well will be constructed if fresh water spring is located within convenient distance of Kodiakadu Rest House	157
The following control records will be maintained:— The Control Book. The Record of Works. The Control Journal. The Control Map	158–159
Contractors will be required to furnish monthly statements showing actual removals which will be checked and entered in Control Book	160–161

Protection Working Circle.

The Working Circle will have an area of 20,180 acres comprising:— (i) A belt of 450 acres in the North and West of Kodiakadu Reserve Forest to be retained permanently. (ii) An area of 1,468 acres in the south and west of the same Reserve which is unfit for felling at present. (iii) An area of 18,202 acres of blanks and water courses in the Mangrove forests of Talanayar and Muthupet.	162
The Working Circle will be given rest from fellings	163
Materials for departmental works and free grants may be cut under proper authority	164
The Working Circle will be open to grazing	167
No separate controls are prescribed. Materials cut for departmental works and free grants can be shown in control form prescribed for Simple Coppice W.C.	168

Grazing Working Circle.

The total area of the Working Circle is 23,820 acres	169
Roughly about 1/5th of the wooded and 1/40th of the gross area is expected to be closed to grazing	170
The object of management is to provide grazing subject to silvicultural requirements and to produce revenue	171
Grazing will be regulated by permits, goats will be excluded	172
Grazing year will be from 1st July to 30th June	173
Calves up to six months old will be allowed free above that age will be charged full rate	174
For Muthupet a fee of As. 8 per cow unit is suggested after the block has been notified under section 16	175
Cattle will be allowed to graze in all the three reserves on payment of the highest sanctioned rate in the district, i.e., Re. 1 per cow unit	176
Penning will not be allowed	177
Levy of a lump sum grazing fee based on cattle-census has been suggested for villages around Kodaikadu	178–180

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Coupes felled under Clear-Felling system need not be fenced	183
Control book is prescribed for Grazing Working Circle	184

Minor Forest Produce Working Circle.

The area of the Working Circle is 23,820 acres and it comprises all the three reserves in the division	185
Removal of— (1) *Cassia auriculata* (2) Manure leaves will not be allowed	186
The Minor Forest Produce shall be exploited through contractors' agency	187
Important items will be sold separately	188, 189
Lease will run from 1st April (for subsequent date of sale) to 31st March	190
Control book is prescribed for this Working Circle	192

Establishment and Labour.

It is suggested to reduce the strength of forest guards by one and instead increase the number of watchers by one and allot the latter to Talanayar where there is no watcher at present. There will be in all one forester, three forest guards, three watchers and one bungalow watcher	194
Sufficient labour is available to carry out works prescribed by the Working Plan	195

APPENDIX I.

List of trees and shrubs in the Kodiakadu Reserved Forest.

Acacia arabica (Karruvai).
Albizzia lebbek (Karuvagai).
Anacardium occidentale (Mundri).
Atlantia monophylla (Kurudu).
Azedarachta indica (Vembu).
Borassus flabelliformis (Panai).
Canthium didymum (Nekkara, Noona).
Cassia fistula (Konnai).
Cordia myxa (Naruvalli).
Crataeva religiosa (Mavalingam).
Dichrostachys cinerea (Vadathovarai).
Eriolæna quinquelocularis (Kara pusarri), rare.
Eugenia jambolana (Nagai).
Flacourtia romantchi (Karaka).
Feronia elephantum (Vela).
Flueggia microcarpa (Poola).
Gmelina asiatica (Kummalai).
Gymnosporia emarginata (Vettaalai).
Hemicyclia sepiaria (Veerai).
Ixora parviflora (Kai palai).
Lepisanthus tetraphylla (Kat ma).
Maba buxifolia (Thovarai).
Mangifera indica (Ma).
Memecylon edule (Kasan).
Mimusops hexandra (Palai, Peria palai).
Mimusops littoralis (Shirutalai palai).
Mimusops elengi (Mahila or Magila).
Nephelium sp (Moni poondi).
Ochna squarrosa (Salundi).
Odina wodiar (Wodian).
Parkinsonia aculeata (Chembukuruvai), rare.
Pleurostylia wightii (Moni kasan).
Pongamia glabra (Pungu).
Premna integrifolia (Mannay or Payemannay).
Randia dumetorum (Kaarai).
Randia malabarica.
Randia uloginosa (Mari kaarai).
Sapindus emaginata (Boondi or Poondi).
Tamarindus indica (Puli).
Thespesia populnea (Pooavarasu).
Zizyphus jujuba (Yelandai or Elandi).

Shrubs and creepers.

Abrus precatorius (Kundumoni).
Adhatoda vasica (Adhatoda).
Asparagus racemosus (Nirvitangkodi or Tannir vitang kodi).
Azima tetracantha (Chengu).
Calotropis procera (Yeruku).
Canthium parviflorum (Kaarai chedi).
Capparis Sp (Toorati).
Carissa spinarum (Kelah).
Cassia auriculata (Avaram or Avarai).
Cassia mimosoides (Poona varai).
Cissampelos pareira (Nalla chendi).
Clerodendron inerme (Peekalati).
Derris scandens (Terrinai kodi).
Euphorbia trigona (Kalli, Tirukkalli).
Grewia sp. (Tavitu).
Jasminum sp. (Oosi mallu).
Jatropha curcas (Katu manarku).
Loranthus logiflorus (Kurvitch).
Mucuna pruriens (Poona katchi).
Olax scandens (Muralli).
Opuntia dillenii (Spat kalli) almost dead.
Pandanus odoratissimus (Talai).
Phœnix acaulis (Sendi or Eechai).
Sarcostema intermedium (Kodi-kalli), rare.
Solanum sp. (Tootu vallai).
Suaeda monoica (Umri).
Tephrosia purpurea (Kolingi).
Tinospora cordifolia (Chendi kodi).
Vitex negundo (Notchi).
Vitis quadurangularis (Pairandi).
Webera corymbosa (Teeranai).
Zizyphus oenoplia (Surai).

The following mangrove species are also found scattered in a few places in this reserve :—

Aegieceras majus (Kanna or Karapukanna).
Avlcennia officinalis (Alayathi).
Excœcarca agallocha (Tillai).
Lumnitzera racemosa (Karri kanna)

Note.—Local names are noted within brackets.

APPENDIX II.

Control Forms.

Control Book for the $\frac{\text{Simple Coppice}}{\text{Clear-felling}}$ Working Circles—Results of Felling.

[Paragraphs 111 and 158.]

Prescription of the working plan.					Operations actually carried out.								
									Yield.			Revenue.	
Year of felling.	Name of the felling series.	Coupe number.	Area (wooded only).	Nature of felling.	Year in which actually felled.	Coupe number.	Area actually worked.	Nature of felling.	Timber—Quantity or number.	Fuel—Quantity in tons.	Thorns and bushes—Quantity in head-loads.	Total.	Price per acre.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
			ACS.				ACS.		POSTS. CFT.			RS. A. P.	RS.
1935–36.	Kodiakadu	I	43·00	Simple coppice with retention of minor forest produce trees.	1935–36.	I	* 45·00	Simple coppice (623 minor forest produce trees not felled).	50 25	450	2,000	450 0 0	10
Do.	Talanayar.	I	14	Clear-fellings with retention of seed bearers.	Do.	I	† 14·3	Clear fellings (290 seed bearers left unfelled).	..	86	..	114 6 0	8

* By actual survey the wooded area was found to be 45 acres.
† Do. do. 14·3 acres.

Control Book for Grazing Working Circle.
[The entries are only sample ones]

[Paragraph 184]

					Description, number and rates.						
Year.	Name of reserve.	Total area of the reserve.	Area closed to all grazing.	Area available for grazing of cattle.	Number of cows and rate.	Number of buffaloes and rate.	Number of ponies and rate.	Number of sheep and rate.	Total number of cow units.	Total revenue realized.	Incidence per cow unit.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		ACS.	ACS.	ACS.							ACS.
1935–36	Kodiakadu ..	3,955	Old coupes XIII, XIV to XVII. New Coupe I. 780.	3,175	1,000 at As. 8.	200 at As. 8.	100 at As. 8.	800 at As. 2.	1,900	750	1·7
Do.	Talanayar ..	3,055	Old coupes II, III, IV, V and XII. New coupe I. 163 only wooded area.	2,892	300 at Re. 1.	2	..	..	300	300	9·6
Do.	Muthupet * ..	16,810	Old coupes IX, XI, VI, XII and I and new coupe I. 354.	16,456	100 at As. 8.	20 at Re. 1.	..	As. 2.	140	70	118·0
	Total ..	23,820	1,297	22,523	1,400	220	100	800	2,340	1,120	

* About three-fourths of this area consists of lagoon and dry salt pans.

Control Book for Minor Forest Produce Working Circle.
[The entries are only sample ones.]

[Paragraph 192.]

Year.	Name of the reserve.	Name of the lease unit.	Description of produce.	Quantity removed.	Price fetched.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
					RS.	
1935–36	Talanayar ..	(1) Whole reserve ..	Nandi and umri.	*6,720 lb. of crude stuff Barilla, i.e., burnt umri.	200	*As per the railway consignments of the crude stuff to Madura.
		(2) Do. ..	Thatch grass ..	100 cart-loads ..	25	
		(3) Do. ..	Limeshells ..	10 Do. ..	10	
					L.S.	
		(4) Addappar river ; Nallar river ; Malaialam ; Mattialam ; Kodushutu ; Sadurakalu ; all other areas not included in the above items.	Fishing lease ..	..	1,200	
	Kodiakadu.	Whole reserve ..	Tamarind, soapnuts, etc.	Tamarind, 100 maunds ; soapnuts, 50 maunds.	100	

Record of Works.

[Paragraphs 111 and 158.]

Working Circle. Tanjore District.

		Description of work.			Operation carried out.				
Year.	Locality .	(*a*) Prescribed with reference to working plan paragraph.	(*b*) Suggested with reference to working plan paragraph.	(*c*) At the discretion of the District Forest Officer.	Year.	Locality.	Description of work and whether done under (*a*), (*b*) or (*c*).	Cost. RS.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1935–36	Kodiakadu.	(1) Demarcation of outer boundary with palmyras and calophyllum seeds 2 miles and coupe boundary 1 (3 miles) at Rs. 2 per mile. (148–149).	Climbers were cut in coupes I and II. (146)	Seeds of margosa soapnut, palai were sown at the edge of the wooded area in coupe I.	1935-36.	Kodiakadu reserved forest.	As in column 3.	10	The work under columns 4 and 5 was done by subordinates free of cost.
		(2) Demarcation of coupe I with corner stones. (153).					Do.	15	
		(3) Earthen bounds to prevent in rush of salt water as indicated in paragraph. (154).					Do.	20	

CONTROL JOURNAL.

[Paragraphs 111 and 158.]

A. Growing Stock.

(i) Natural reproduction.

(*a*) From seed.

(*b*) Coppice.

(ii) Good seed years (of important species).

(iii) Season of flowering, ripening of seeds.

(iv) Number of seed bearers or minor forest produce yielding trees retained in each coupe.

B. Factors influencing the crop.

(i) Forest offences including notes on injury to the forest by causes other than illicit removals or grazing.

(ii) Notes on water-supply and rainfall.

C. Exploitation.

(i) Results of coupe sales.

(ii) Results of minor forest produce sales.

(iii) Statement of outturn of fuel and minor forest produce.

(iv) Comment on why any particular series could not be worked in any year.

(v) Full account of deviation in the Working Plan, if any, with detailed justification.

D. Results of Work done.

(i) Climber cutting.

(ii) Bunding operations.

(iii) Palmyra sowings along boundary lines.

(iv) Demarcation.

(v) Notes on the condition, repairs, renewals of cairns, boats, buildings and wells.

(vi) Notes on experiments of digging channels and Alayathi sowings carried out with results.

General.

(i) Note on ravages by wild animals such as jackals or pigs, etc., with measures adopted to control them.

(ii) Shikar notes including notes on the shooting licences issued and detail of game shot.

(iii) Summaries of annual revenue and expenditure in such a form as will facilitate com-Pasiron with the financial forecast in the working plan.

Proceedings of the Chief Conservator of Forests

Proceedings No. 322, Press, 1st August 1935

Working Plan—Tanjore forests—Sanctioned.

T. A. Whitehead, Esq., I.F.S.,
Acting Chief Conservator of Forests.

Read—the following papers :—

Letter from the Working Plan Officer, Tanjore, dated 14th February 1935.

Endorsement of the Conservator of Forests, Coimbatore Circle, dated 14th February 1935, C. No. 382/35-A.-2.

Letter from the Collector of Tanjore, dated 1st March 1935, No. 2878/35.

Endorsement of the Conservator of Forests, Working Plans Circle, dated 13th March 1935, No. A–223/35.

Proceedings—No. 322, Press, dated 1st August 1935.

Sanctioned.

T. A. Whitehead,
Acting Chief Conservator of Forests.

To the Conservator of Forests, Coimbatore Circle.
" Conservator of Forests, Working Plans Circle.
" Collector of Tanjore.

Copy to other Conservators.
" all District Forest Officers.
" the Principal, Madras Forest College.
" the Provincial Sylviculturist.
" the Working Plan Officers.
" the President, Forest Research Institute, Dehra Dun